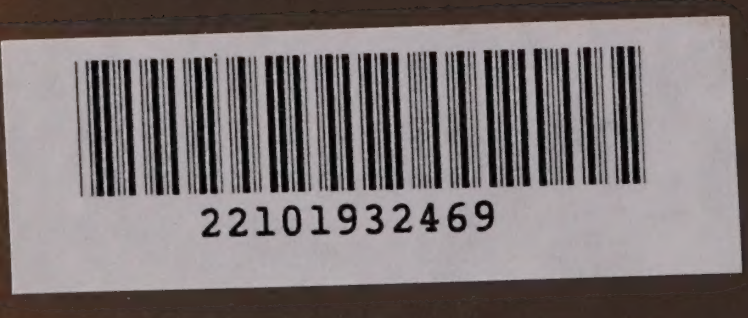
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SOME FALLACIES OF STATISTICS

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ESSAYS AND PAPERS

ON

SOME FALLACIES OF STATISTICS

CONCERNING

LIFE AND DEATH, HEALTH AND DISEASE

WITH

SUGGESTIONS TOWARDS AN IMPROVED SYSTEM OF REGISTRATION

BY

HENRY W. RUMSEY, M.D., F.R.S.

AUTHOR OF 'ESSAYS ON STATE MEDICINE'
'SANITARY LEGISLATION'
ETC.

LONDON
SMITH, ELDER, & CO., 15 WATERLOO PLACE
1875

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DEDICATION

TO

WILLIAM FARR, Esq., M.D., F.R.S., D.C.L.

GENERAL REGISTER OFFICE, LONDON.

My dear Farr,

These pages concern matters on which you are unanimously and most deservedly recognized as our highest European authority.

Perhaps, while objecting to the occasional misapplication of your figures, I may have criticized too freely statistics published under your sanction. I am aware of the peril of my undertaking, and of its imperfections; nevertheless, I look to you as my earliest guide in the study of Vital Statistics, and I am unwilling to let this collection of my statistical papers go before the public without acknowledging your claims as one of my oldest allies in the warfare of sanitary science against indifference, ignorance, and prejudice. Nor do I make the attempt without a pleasing and grateful recollection of our uninterrupted friendship of forty years' standing, and of your unvarying support and valuable counsel in many public efforts.

Believe me to be,

My dear Farr,

Yours ever faithfully,

H. W. RUMSEY.

Knoll Hill, Prestbury,
near Cheltenham:
June 1875.

PREFACE.

In selecting a portion of my writings for an emended edition, there seemed to be special reasons for revising and publishing an uncollected series of articles on 'The Fallacies of Vital and Sanitary Statistics.'

The Births and Deaths Registration Bill of 1874 offered an occasion for the correction of defects and fallacies, whether already noticed or recently brought to light, by securing the supply of more full and accurate information from the local officers, by enlarging their powers and responsibilities, and by improving for some purposes the qualifications of both Registrars and Superintendent Registrars.

But the Act makes no organic change in the machinery or method of registration.

Some think also that the opportunity might well have been seized to separate some departments of registration, which they contend need never have been combined.

The records of births and deaths, as the beginnings and endings of life, are events naturally and essentially connected with health and disease and causes of death, and might thus form one register. It has also been said that the registration of marriages might be treated either separately or in connection with other civil, judicial, and social statistics.

However, there are cogent reasons for the retention of the present combined register; and there are always objections to the dislocation of existing and long-established arrangements. Births, deaths, and marriages have been registered together by the same department for nearly forty years; and there are also weighty physical reasons for their continued combination. What reformers may more reasonably contend for, as necessary to a due and long demanded extension of our registration system, is the registration of disease; and for this the new Act makes no provision.

Probably there would be manifest advantages in leaving marriages wholly to one class of officers, the *Superintendent* Registrars; relieving these, at the same time, from all concern in the records of sickness and of the causes of death, for which they are generally unsuited and unqualified.

The whole question, also, of a general revision of districts, in a sanitary and medico-legal aspect, is still untouched; and the monstrous error, committed in the original Act, of leaving the determination of these districts to the National Destitution Authorities, is still unremedied. But clauses 21 and 22 of the new Act authorize the Registrar-General, with the sanction of the Local Government Board, from time to time to alter districts and boundaries, and to form new districts as *sub*-districts. Yet a complete revision of districts is essential to a correct sanitary organization of the kingdom, and ought to be executed on a large and comprehensive plan.

The interesting remarks, in 'Social Pressure,' by that distinguished essayist Sir Arthur Helps—whose recent loss we all deplore—on county administration in connection with

local government, indicate, though not very distinctly, the course which the Legislature might take in amending the territorial divisions of the kingdom, especially in the sanitary and scientific departments of administration.

It was part of my original design to complete my statistical criticism by treating of the fallacies arising from ill-contrived and unreasonable districts; but I found that this extensive subject had not, at that time, been sufficiently investigated even to show in what directions the main sources of statistical fallacy lay. However, the inquiry has been since more widely and fully extended, and the Report of the Parliamentary Committee of 1872 on Boundaries has thrown a flood of light on the perplexing facts of conflicting local areas and boundaries.

But the due organization of districts and groups of population is by far too complicated and difficult a matter for any Parliamentary Committee, composed, as it must be, of party elements—*i. e.* of gentlemen whose qualifications and views are mainly limited by the ideas of their constituencies, and are for that reason really unfit to deal with questions the right settlement of which must depend on cultivated intelligence and emancipation from narrow interests; in fact, on the best of the people,—such as the independent statesmen, to whom 'Mr. Milverton' looks forward hopefully to exercise due weight in the solution of those momentous questions, which are the last to be abandoned to popular constituencies and their mouthpieces.

Mr. Stansfeld's Committee could not even make up its mind to recommend the Crown appointment of a well-selected Boundary Commission; nor, indeed, would highly-

informed, candid, and thoughtful men have been content to leave the appointment of such a Commission to a statesman of Mr. Stansfeld's stamp.

Should my life be spared, and my health recover sufficiently to face the subject, I may endeavour to express my own deductions from the evidence taken by the Boundaries Committee and from other sources; in fact, from the many interesting facts—historical, topographical, and administrative—on which any legislation, to be successful, must be founded, so as to remove the anomalies, many almost absurd, which have shaped the present territorial limits and divisions of the kingdom.

The omissions of the Act of 1874 are partly formal, partly essential. The Act itself ought to compel the Registrar to procure, from trustworthy informants, statements of all essential facts, which should not be left to directions contained in the original Acts, but form an integral part of the local record; nor should any such particulars of registration be left to the medical certifier, who ought to be confined solely to matters of professional observation and opinion.

In making registration (especially of births) compulsory, and in imposing on parents and others legal responsibility under penalty for neglect to give information, the Act supplies a notorious defect in our code. It is well also to have extended the category of legal informants, both of births and deaths. The Act, without expressly providing for the separate registration of still-births, furnishes some check, though hardly adequate, both on the burial of the still-born, and on burial of the dead without a medical

certificate of the cause of death. While it is grossly unjust to enforce a penalty on the medical attendant for refusal to give such certificate without compensation, the enactment fails to meet the whole difficulty, as *e.g.* in those deaths, which often occur, where there has been no medical attendant, or where the corpse is medically visited by one who never saw the living body, and who may therefore be unable to sign the present form. The provision in these cases of a skilled certifier has been neglected by Parliament.

The convenient extension of the period for legal registration, after the event, is justifiable solely on condition that the duty of completing the ultimate registry be imposed, under penalty, on the Registrar himself.

A better form of medical certificate is still needed. As repeatedly urged, this form should be more elastic; nor should the medical certifier be committed to any statement not founded on his own personal knowledge; neither should he have anything to do with facts of simply legal import, such as the exact age, time of death, place of death, and length of residence therein before death, birthplace (referring to birth register), condition, class or occupation; all which facts are, nevertheless, very essential to a complete registration, and yet are wholly unprovided for in this enactment.

The transmission of the registry of recorded facts, as in the case of the Coroner, should be made compulsory on the local Registrar, as soon as the information is received, for the sake of public health and public safety.

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SOME FALLACIES OF STATISTICS,

&c.

I.

ON CERTAIN DEFICIENCIES IN OUR PUBLIC RECORDS OF MORTALITY AND SICKNESS, WITH SUGGESTIONS FOR AN IMPROVED NATIONAL SYSTEM OF REGISTRATION FOUNDED ON SCIENTIFIC INQUIRY.

A Paper read at the Bradford Congress, October 12, 1859.

(*From the Transactions of the National Association for the promotion of Social Science.*)

ALL who are interested in the cause and progress of sanitary science are aware of the invaluable aid it has received from the publications of the Registrar-General. They are, in fact, our first text-books in the study of hygiene—the very accidence of our grammar. And it is no depreciation of the acknowledged merits of the official chief of that department to add that the scientific value of his reports is mainly due to the celebrated medical statist who was fortunately selected by the Government to aid him, and who, from the date of the first Registration enactment, has ceaselessly endeavoured to animate the movements and correct the aberrations of its vast machinery, curiously developing, from the mist of atomic facts contributed by the local Registrars, the grand though hitherto shadowy outlines of the form of our national Hygiea —a vision which inspires her votaries with earnest resolves to trace more clearly her true proportions.

It is not, therefore, from indifference or insensibility to the magnitude of what has been achieved that I now proceed to insist upon the importance of much that yet remains to be accomplished; and as no eulogy of mine is needed by those who direct the present arrangements, so I trust no apology will be

expected from me if I attempt to show the utter inadequacy of existing means to the requirements of an advancing science, and to the due application of its benefits to the people. The more important defects of our registration system may be thus briefly described :—

1. The imperfect and often erroneous certification of the causes of death, especially in crowded districts,[1] and the absence of any sufficient provision for verifying and correcting reported facts, so that conclusions founded on these returns are often worse than useless.

2. The frequent omission to register births, 'owing to a defect in the Registration Act,'[2] and the non-registration of still-births, so that it is impossible either to calculate correctly the natural increase of population, or to ascertain the number and the causes of the deaths of new-born infants.

3. The want of correct and accessible information respecting the diseases recorded by the medical officers of unions and other public institutions, with especial reference to their causes, consequences, and periodical prevalence.

4. The want of an organized system for the compilation and publication of such facts in every district.

5. The want of correspondence between the boundaries of Registration districts or sub-districts, and the boundaries of districts constituted for municipal government or sanitary management, so that local investigators are generally compelled to set aside the Registrar-General's returns, and to collect and re-arrange the materials, at a vast expenditure of time and labour, for the purposes of sanitary inquiry.[3]

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[1] See information supplied by provincial officers of health. (Essays on State Medicine, pp. 102-3-4, 350.) See also Mr. Alfred Aspland's paper 'On Certain Fallacies in our National Mortuary Returns.' (Transactions of Manchester Statistical Society.)

[2] See 20th Annual Report of Registrar-General, p. 1.

[3] Some instances of conflicting boundaries will be described in subsequent essays, papers, and evidence.

6. The general nonconformity of the limits of Registration districts and sub-districts with the natural characteristics and boundaries of the locality.[1]

7. The entire neglect of many observations, social and scientific, which are absolutely essential to safe conclusions in matters of public health, and which can only be efficiently reported under a national system of Registration.[2]

There are, moreover, some specific anomalies and errors in the present system that serve to indicate the direction in which a reform in our vital and sanitary statistics should proceed.

(*a*) Among the 624 Superintendent Registrars in England and Wales, there are probably not ten[3] who are known as scientific men or who superintend the Registration with a view to the advancement of sanitary science.[4]

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[1] Some singular instances of this contrariety might be cited. One may here suffice. The Forest of Dean is an extensive district, of remarkable geological formation, bounded on two of its three sides by important rivers, and inhabited by a distinct class—I might almost say race—of people, living for centuries past under peculiar laws and local customs, and now largely employed in mining and metallic works. One might expect that the published statistics of mortality and reproduction in the Dean Forest would throw some light on the physical and sanitary condition of its inhabitants. But the census and registration returns give no precise information on the subject; for not only do those districts (unions) which contain most of the Forest parishes, include other parishes, outlying and different in kind, but no fewer than twelve of the real Forest parishes, with a total population of more than 20,000, are included in unions belonging to the adjacent 'Registration counties' of Hereford and Monmouth. Nor do the Forest portions of these unions constitute separate sub-districts, so as to admit of being again grouped together for statistical returns. To determine, therefore, the longevity, mortality, and sanitary state of this singular people would require a new territorial distribution of the population and a new compilation of primary facts.

[2] These questions are discussed at some length in the third of the writer's 'Essays on State Medicine,' 1856.

[3] Only four were 'medical' in 1853.

[4] Mr. May, of Macclesfield, a Superintendent Registrar, in an able paper read at the Birmingham meeting of the Association, showed how beneficially his important office might be directed to the promotion of sanitary measures.—*Transactions*, 1857, p. 403.

(*b*) The office of Superintendent Registrar of Births and Deaths is essentially distinct from that of Superintendent Registrar of Marriages; and the combination of these functions (by the 'Act for Marriages' of 1836) has led to a mistaken estimate of the objects of the former office as well as of the personal qualifications requisite for its proper execution; for the duty of superintending the performance and registration of marriages seems naturally to belong to members of the legal profession and others who, as clerks of unions, now generally hold the appointment. But the supervision and correction of local records of mortality and reproduction would fall no less naturally to persons medically educated, and in scientific hands might conduce materially to the improvement of the public health.

(*c*) There is no legal or authorised co-operation between those officers (of either grade) who are charged with the registration of deaths and those who record cases of sickness and accident in unions, hospitals, and public institutions. The certified 'cause of death' returned to the Registrar-General is very often a different disease from that recorded for the same case in the books of medical charities or poor-law medical officers. Even with a steadily diminishing proportion of uncertified deaths, the certificates themselves too often show carelessness in record, if not errors in diagnosis.[1] Superintendent Registrars have no power to revise the medical certificates, or to promote a more correct nomenclature of diseases, or to correct the blunders of ignorant non-medical registrars; nor are they technically qualified to exercise such powers, great as is the necessity for some methodical revision of the Registers by an instructed local officer.

[1] Ample excuse will be made for the scientific imperfections of the certificates by those who practically know the irregularity with which these certificates are procured, and who recollect that the statement of fatal causes is entirely a voluntary service rendered gratuitously by many thousands of practitioners for the public benefit.

(*d*) There are literally no published records of the cases of sickness attended at the cost of the community. The sanitary state of the people is, therefore, inferred solely from the number of deaths—that is, from only one of the results of sickness—no public account being taken of the number and duration of the attacks which shorten the effective lifetime of the population.

Facts are accumulating to prove that the mere number of deaths occurring in any locality bears no constant or even approximate ratio to the real amount of unhealthiness existing there. As a necessary result of improvements in domestic management and medical treatment, and owing to the removal or absence of those more virulent agents of destruction which, by sharp and decisive strokes, prematurely sever the thread of life, its duration has been lengthened in our great cities; but, at the same time, the sickly and infirm period of existence has been prolonged probably in a greater degree than even life itself. Chronic diseases, or at least functional disorders, have increased. Vital force is lowered. Man's work is arrested; his duties are unperformed; his objects fail; though he still lives. Weakly, diseased children are now mercifully helped, as they never were in olden time, to grow up into weakly, ailing adults, who, in their turn, propagate, with abnormal fecundity, an unsound progeny. Is this true sanitary progress? Does it deserve the ostentatious parade of a decreasing death-rate?

Lastly, personal antecedents and remote causes of deaths now generally escape notice. The deaths of those who merely enter a district to die there belong rightfully to another locality; and vast numbers succumb in our large towns, in seaports, in public establishments, hospitals, asylums, workhouses, and prisons, whose diseases were not acquired in the places where they died, and who can scarcely be said to have lived there. The mere death-

rate, therefore, without the life-rate of the inhabitants, may and does lead to most fallacious conclusions as to local unhealthiness. Moreover, when the ages of a population are examined, the crude and hasty deductions from a general death-rate are often reversed.

Such are some of the more striking fallacies of the sanitary statistics of this country. It would be easy to show how they affect and are affected by certain acknowledged errors and defects in our various public medical provisions for the sick poor. But this and other questions of local administration are too wide for discussion in this paper. For the present I am content to urge that the true and safe course of the sanitary reformer lies in the path of sanitary inquiry—a path on which we have only just entered, and in which our steps are still hesitating and uncertain.

It is therefore suggested that the Legislature should without delay engraft upon the existing arrangements for registration an improved machinery for the collection of vital and medico-sanitary statistics.

A scientific officer is required in every registration district or group of districts, out of the metropolis, to superintend the registration of births and deaths; to promote greater care and accuracy in the certification of causes of mortality; [1]

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[1] 'They (superintending officers of health) would soon give to the registration that degree of accuracy and completeness which would fit it in a perfect manner for every use, civil and legislative, to which a perfect registration is capable of being applied.'—Dr. Southwood Smith. *Health of Towns Commission*, First Report. 8vo. vol. i. p. 40.

'A medical registrar would be especially useful in avoiding mistakes in copying the medical certificates of death. At present many monstrous words and ridiculous errors occur from the illegibility of the certificate, which a medical registrar would be able to avoid.

'A medical superintendent registrar would be useful in detecting the errors of the non-medical registrar, when he collates the certified copy of the register with the original before it goes to London.

'Both would be useful in asking now and then for additional infor-

to compile a local register of sickness from the medical returns of parochial districts, workhouses, and other rate-supported institutions, hospitals, and dispensaries, provident societies, and public works; to inquire carefully into the causes of illness and epidemic visitations; to note physical phenomena and social conditions in connection with disease; and to aid in diffusing locally the information thus obtained.

Here I deem it advisable to enter into some details respecting the official qualifications and scientific knowledge which might be fairly required of candidates for the proposed office of Sanitary Superintendent; and in so doing I shall have briefly to notice certain functions not at present connected with the registration department, but which, nevertheless, this officer ought to be prepared to perform, unless they are executed by an independent medical officer of health.

In the first place, as Hippocrates taught, he ought to be thoroughly acquainted with the natural and social peculiarities of the locality in which he is to act. He should know its climate, soil, and waters, as well as the habits, occupations, and circumstances of its people, and the general characteristics of its *fauna* and *flora*. He ought to be competent to investigate unusual or morbid conditions of the vegetation of the district, to notice developments of peculiar forms of insect or animalcular life in air and water, to inquire into the nature and relations of such phenomena, and their influence upon the health of the higher orders of animals. He would naturally be the authorised reporter of meteorological observations for the district. The same officer should also be competent to aid in geological researches

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mation or explanation from the medical practitioner who gave the certificate.'—Dr. Greenhill: quoted in *Essays on State Medicine*, note, p. 353.

with reference to social objects: as drainage, water supply, building, &c.[1]

Again, in the application of chemistry to local purposes, similar necessity exists for scientific agents in official position.

To determine the composition and qualities of soils and waters; to analyse manures and crops; to test the purity, detect the adulterations, and indicate the comparative advantages of articles used for food and drink; to ascertain the genuineness of medicines, and to reveal the presence of poisons in manufactured articles or organic structures,—all these are duties pertaining to the office of a highly-qualified public analyst and histologist, who should be responsible, on grounds of public safety, not so much to the producers, manufacturers, and retail dealers of the locality, or their representatives, as to the nation in its collective capacity.

In places where there is no public professor of the natural sciences, an officer of this description might act as an instructor of the people in matters which connect science with daily life and labour. The public chemical laboratory, with philosophical apparatus and mechanical or industrial models —for there should be such an institute in every populous district—might be open, under his superintendence, not only for the gratuitous instruction of the people, but for their personal security, as the public office at which adulterations in articles of daily consumption might be detected.

In large and populous districts, however, these duties would doubtless be better performed by a distinct chemical officer, who might be either the deputy of the sanitary superintendent, or his coadjutor.

It seems also obvious that the same kind of officer would

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[1] Agricultural statistics are never likely to be satisfactorily reported, unless under some such scientific direction, which shall connect them with other objects of public utility, and divest them of their merely fiscal character.

be the most available and trustworthy referee in those legal inquiries which are held to determine the causes of suspicious deaths and public calamities, and which so seriously concern human life, health, and liberty. An independent officer, thus highly qualified, could alone be relied on for correct reports as to the effects of various occupations and commercial processes, either on the persons employed in them, or on the surrounding population, if they are permitted in towns. He would also be an unbiassed authority for certifying the age and the fitness of children for factory labour.

One or (if necessary) two officers, thus qualified and thus engaged, would naturally become the scientific advisers, if not assessors, to local executive boards.[1]

The regular statistical reports which I have suggested, exhibiting the fluctuations of vital force in man, animals, and plants, under varying material or climatic conditions, and in connection with local customs, habits, and regulations, should be printed and circulated for municipal and popular information in every district. All this could be done without fear, favour, or prejudice, only in case the proposed sanitary superintendents were made independent of disturbing local influences. They should be 'emancipated from all such interference as is calculated to obstruct the zealous performance of their duties.'[2]

This is doubtless the chief desideratum in the sanitary management of our towns and districts.

But inasmuch as persons possessing the requisite scientific qualifications, habituated to official duties, and ready for employment, are at present but rarely to be found; and as, in any case, it is desirable to avoid sudden and sweeping

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[1] 'As assessors or advisers to executive boards, the services of scientific men would be highly valuable.' (Glasgow Report of British Association, Parliamentary Committee, p. 56, 1855.)

[2] See Glasgow Report, supra cit., p. 62, 1855.

changes, I propose that these appointments be gradually made, one by one, as vacancies occur in the post of Superintendent Registrar. Not fewer, I believe, than twelve of these vacancies happen yearly. Let them be filled in future by persons medically educated, whose scientific qualifications shall have been satisfactorily tested. Let these officers be responsible to Government, and be paid out of the Consolidated Fund, as the Superintendent Registrars now are. Their reports, founded on the various returns collected by them, might be sent, in the first instance, to the General Register Office—as the statistical department of Government—there to be corrected, abstracted, and compiled. The results might be forwarded to the Privy Council, as the medico-sanitary department of Government. It is of the highest importance that the power of appointing and dismissing these reporters should not be vested absolutely in local boards, which by no means represent the sanitary interests of the lowest class of rent-payers and operatives, and their families, who are the chief sufferers from removable causes of disease.

The metropolitan districts need not at present be included in any measure of this kind, for several reasons, of which only one requires mention. There are already officers of health appointed in every London district; and whether their relations with the registration officers and with the medical attendants of the sick poor are satisfactory or the reverse—whether their peculiar official position promotes or hinders the beneficial objects of their appointment—it is certain that the metropolis requires exceptional management, and that any defects in its medico-sanitary organization would require a special measure of reform. All that I ask with reference to the metropolitan system is—that it may not be extended to the country at large.

I repeat, then, that the Sanitary Superintendents of Registration, now proposed for the provincial districts, should be

authorised (1) to receive the returns of sickness and mortality from the various official persons responsible for such returns; (2) to make special inquiries into alleged causes of disease and death, especially when unexplained or unusual in amount; and (3) to compile these returns and observations in a prescribed manner, and report them quarterly (or oftener in emergencies) to the General Register Office; the results relating to each district to be published separately, in a cheap and intelligible form, for the use of the inhabitants.

It is not proposed that the Scientific Superintendent should be at once empowered to fulfil all the duties which properly belong to a health officer; neither is it meant that the appointment of a regular officer of health, wherever duly resolved upon, should be deferred until a vacancy occurs in the office of Superintendent Registrar; but I call attention to the fact, that the original scheme for officers of health in England included supervision of the registration of births, deaths, and diseases.[1] And it is doubtless owing to the subsequent omission of this part of the health officer's functions, that these appointments have failed of their original design in so large a proportion of the few districts in which they have been made.

In proposing, therefore, to start simply with the 'Registration' department of the health officer's duties, I fall back upon an old principle in connection with an existing office; and this, I submit, would be less likely to encounter opposition in the House of Commons than a more complete but distinct project for the institution of officers of health throughout the kingdom.

Even the minor and tentative course now suggested is

[1] See General Sanitary Report, 1842, pp. 350–356. 'Administrative Means for the Extension of Medical Science.'

See also Report on Interment in Towns, 1843, pp. 123–126.

See also Health of Towns Commissioners' First Report, 1844. 8vo. vol. i. pp. 37–40.

impossible without an amended Registration Act. The Registrar-General, with his present powers, could not, were he so disposed, inaugurate the reform. But if Parliament could be prevailed upon to try the experiment thus cautiously and gradually—the Government and the press watching, reporting, and improving, if necessary, the operation of the measure in the districts to which it might be applied—there is a strong probability that in a few years the growth of public intelligence on this question would lead to a demand for its general adoption; even at the cost, if unavoidable, of compensating a number of the old Superintendent Registrars.

A Registration department, thus reformed and extended, would prove a powerful engine of public instruction. It would aid and lighten the duties of local boards and philanthropic workers; and it would pave the way for that more complete and efficient sanitary organization which the country will in time call for.

Some estimate of the cost of this extension of the Registration Office may be fairly demanded of me. Now, it would be impossible to name any amount of annual charge upon the public funds which would be satisfactory to those who do not perceive the immense importance of the objects which it is proposed thus to accomplish. The same variety of motives—the least discreditable of them arising from ignorance of the subject—which raised a parliamentary opposition almost sufficient to defeat the Public Health Bill of last session (1858), would probably create a majority against any measure, however well contrived, for the general and immediate organization of a scientific corps.

To abate the just requirements of sanitary reform in the vain hope of mitigating the hostility of its irreconcilable opponents, or of firmly attaching its professed yet insincere allies, would be an abandonment of principle to which I cannot consent. The advantage of my plan, however, is, that

it does not immediately involve any general or extensive change. If, in the case of public education, Parliament consents to a vast annual increase of the national grant, we may reasonably ask for a much smaller increase in the sums voted for the closely-allied department of sanitary inquiry, instruction, and inspection.

If, for instance, the moderate sum of 100,000*l.* per annum were to be ultimately applied to the stipends of the whole body of scientific Superintendent Registrars for England and Wales, exclusive of the metropolis—that is, for 587 registration districts in the ten provincial registration divisions, it would allow 170*l.* per annum on the average for each district. But two, three, or more of these might often be united, and the average salary of each sanitary superintendent would ultimately amount to more than 400*l.*

The present Superintendent Registrars received in 1857–8, from the Consolidated Fund, 9,130*l.* for births and deaths only. If an average of twelve of these appointments should become vacant annually, the increase of charge upon the Consolidated Fund, caused by the adoption of my suggestions, would at first be scarcely more than 2,000*l.* per annum. The augmentation would become more rapid, as in the course of time the vacancies became more frequent, until in about thirty years (if not sooner by general consent) the organization might be complete; so that the national income would not be charged considerably until the measure had been fairly tried and public opinion enlisted in its favour.

But it appears to me so important to guard the independence of this official corps, that I doubt whether a post of even 400*l.* a year ought to be held by anyone, however qualified, who might be professionally dependent upon his neighbourhood for the larger portion of his income, and therefore constantly tempted to make his public employment secondary and subservient to his private gains. If this

objection be well founded—and there are facts enough to support it—we are led to take into consideration certain other sanitary and medico-legal functions, the necessary remuneration for which, being paid chiefly out of local funds, might be added to the suggested Government salary, so as to place the sanitary superintendent in the position required for the free and impartial exercise of his office.

To these additional public functions I propose to call your attention in a following paper.

I now merely add a few words on the mode of testing the important qualifications of the proposed officers.

At present no university of the United Kingdom grants a degree in the natural sciences corresponding to those qualifications. Nor has any examining 'Board of Science'—as recommended by the British Association—been constituted. The Legislature lately passed a measure for regulating the qualifications of practitioners in curative medicine, but the 'Medical Act' contains not a single provision relating to practitioners in preventive medicine. Yet the latter is admitted to be the higher department of the profession, as it is undoubtedly of the greater moment to the State and to the interests of the community.

The only step hitherto taken by Parliament towards the requirement of sanitary knowledge, as a condition of sanitary employment, is a clause in the Public Health Act of last session, whereby the Privy Council is empowered to issue regulations for securing a 'due qualification for vaccinators.' Yet what is this special vaccinating qualification but a fraction of that general sanitary qualification—that competent knowledge of hygiene—which ought to be required of every public medical officer? It is, therefore, time to demand a State examination for sanitary appointments; and a Committee of Privy Council on Public Health, aided by the new 'Medical Council,' would probably be the fittest authority

to determine the nature and extent of qualifications, and to appoint a Board of Examiners.

To what extent the principle of competition should be applied to these examinations would be a matter for future deliberation. In the main it is a good principle; yet there are some essential qualities, moral and intellectual, which could not well be determined by a mere competitive trial. The foregoing suggestions may be thus summed up :—

1. In the event of the death, or resignation, or removal of any (extra metropolitan) Superintendent Registrar, the duties of his office to be divided between two officers, as follows :—

Those duties which relate to notices, licences, performance and registration of marriages, to be still committed to the clerk of the union, or other person appointed by the board of guardians :—

The superintendence of registration of births and deaths to be committed to a sanitary officer.

2. The registers of births and deaths, with the certificates of causes of deaths, to be examined and revised by this Sanitary Superintendent, who should also be empowered to collect returns of all cases of sickness and accidents attended by the union and workhouse medical officers, as well as of cases relieved by any hospitals, dispensaries, societies, and other public institutions within his district; the persons making such returns being paid for the same at the rate of per case. The reported causes of sickness, infirmity, and mortality to be carefully inquired into by the Sanitary Superintendent, especially those connected with locality, soil, density of population, dwellings, water supply, food, occupations, habits, &c.

3. These corrected returns of births, deaths, and diseases, together with meteorological observations, and notes of local events and circumstances affecting the public health, to be

reported quarterly (or oftener if necessary) to the Government, and to be published annually by the sanitary superintendent of each district or group of districts, in a local report, which should give a comparison of the local sickness and death-rate, with averages taken from the kingdom, from the country, and from districts under similar circumstances. These reports to be circulated among all members of local boards, magistrates, and other official persons, and to be offered to the public at a low price.

4. The proposed Sanitary Superintendents of Registration —as statistical reporters for national purposes, independent of local and political influences—to be paid out of the Consolidated Fund; and their appointment, if made by local boards, to be subject to such regulations and conditions as might be required for the safety of large classes unrepresented by these boards, and to such tests of qualification, by examination or otherwise, as Parliament might determine.

5. The Registrar-General, or some central authority, to be empowered to combine two or more registration districts for the purposes of this measure; and also to alter the boundaries of districts and sub-districts wherever they are shown to be generally inconvenient and to need re-adjustment in harmony with local sanitary jurisdictions.

The following among other alterations would be required in the Acts for Registration and Marriage, 1836-7:—

Reg. Act, § 7. Repeal provision that the clerk of guardians shall have the option of accepting office of Superintendent Registrar of Births and Deaths.

Mar. Act, § 3. Repeal provision that the Superintendent Registrar of Births and Deaths shall be Superintendent Registrar of Marriages.

All provisions in the Marriage Act relating to notices, licences, performance and registration of marriages by Superintendent Registrar, to apply only to the Superintendent Registrar of Marriages.

Registers of births and deaths to be kept separately from those of marriages, and under the custody of the proposed Sanitary Superintendents.

II.

ON CERTAIN DEPARTMENTS OF MEDICO-SANITARY POLICE AND MEDICO-LEGAL INQUIRY, IN CONNECTION WITH THE SCIENTIFIC SUPERINTENDENCE OF MORTUARY REGISTRATION.

A Second Paper, read at Bradford, October 13, 1859.

(*From same Volume of Transactions.*)

In concluding my suggestions on the improvement of the statistics of births, deaths, and sickness, I said that there were certain other functions of sanitary inspection and of medico-legal inquiry which might be advantageously entrusted to the proposed scientific superintendents of registration.

Considerations of administrative economy, no less than the intimate mutual relations subsisting between these several offices, render it of great importance that they should be treated as parts of one project.

1. The first of these departmental functions, therefore, to which I would direct your attention, is the inspection of vaccinations.

No one who is thoroughly informed on this question would venture to assert that the present law and practice of public vaccination in England are satisfactory and efficient, and that no further legislative interference is required.

Mr. Simon's letter to the president of the late General Board of Health on this subject—an exhaustive and most valuable document—contains statements founded mainly on Mr. Marson's original observations, which leave no room for doubt that the imperfection of the safeguard afforded to the English people by vaccination is attributable more to the faultiness and inefficiency of the vaccination itself, than to

the omission of its performance. Mr. Marson has proved that the intensity, if not the amount, of post-vaccinal small-pox (*i.e.* the danger of the disease among the vaccinated), is greater exactly in proportion to the badness of the vaccination. The best performances of this operation show a rate of mortality from subsequent small-pox only one-thirtieth of that which results from the worst; and (I believe from the same cause) there is an enormous and increasing prevalence of modified small-pox, not often ending fatally, yet perpetuating the horrid disease by contagion.

Before, therefore, we can reasonably call upon the Legislature for more stringent compulsory enactments, we should demand security for better vaccination, *i.e.*, for greater care that the lymph to be transmitted shall be taken only from perfect cases, for greater attention to the health of the subjects, for greater accuracy in the operation itself, for more critical observation of its result, and for more caution in certifying the production of the true Jennerian vesicle.[1]

We may, I believe, rest satisfied that all which central administration can effect in this country will be effected under the able direction of Mr. Simon, whose office, fortunately for this and other sanitary reforms, is now made permanent; but I do not hesitate to express my conviction that, of far greater importance than direct Government interference, or than any positive instructions to vaccinators, would be the impartial inspection of the vaccinated cases by a local scientific officer. This can be secured, in my opinion, only by separating the function of operating from that of certifying, and by committing the latter to the inspecting officer.

One of the chief defects in the working of our present legalized system is the omission of certification. Private

[1] 'Millions of vaccinations have been performed with lymph not fully possessing its original endowments.' Papers on Vaccination. Mr. Simon to General Board of Health, 1857, p. 39.

practitioners in a large number of instances not only neglect or decline to certify at all, but probably in most cases they omit to send the duplicate certificate to the registrar. Public vaccinators must also be remiss on this point, for Mr. Griffin, in his useful 'Vaccination Statistics,' shows that out of 411,268 cases reported to be successfully vaccinated at the public charge in the year ending September 1857, only 376,798 were recorded by the registrars, and the latter number of course includes private cases which were not paid for by boards of guardians.[1]

Now, if penalties are to be enforced for neglect of vaccination, they should be imposed, not upon the non-vaccinated, but upon the non-certificated. Admission into schools, colleges, service of any kind, professional or mercantile employment, without a certificate or other proof of efficient vaccination, ought to be made a punishable act, as it is in some continental states. This, though an indirect method of compulsion, would be much safer and surer than that adopted —but not carried into effect—in England.

The public can possess no reliable guarantee for the proper execution of this protective measure until the Legislature creates a special agency for inspection and certification.

The proposed Sanitary Superintendents of Registration, or their appointed deputies, would be the proper agents. But how should they be remunerated? Mr. Griffin says that the average payment for vaccination in England and Wales is 1*s.* 7¾*d.* per case, while in some unions it is 2*s.* 6*d.* The Act specifies 1*s.* 6*d.* for cases within two miles, and 2*s.* 6*d.* for those beyond. Not only medical bodies, however, but

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[1] 'The order is felt to be so irksome that it is not complied with.' Mr. Griffin, *Lancet*, July 16, 1859. And 'this result can hardly be considered surprising when we reflect on the injustice, as well as impolicy, of arbitrarily requiring professional services without any corresponding acknowledgment.' (Memorial of Epidemiological Society, 1855.)

official authorities, seem to be generally of opinion that the payment for all duties connected with public vaccination should be raised to 2*s.* 6*d.* and 3*s.* 6*d.* respectively. Assuming this increase of remuneration, I propose, first, that the present legal rates be paid to the vaccinator, who should be required simply to record the operation, and thus be relieved of all further trouble and responsibility in the case; and, secondly, that the additional shilling be paid to the inspector for examining, certifying, and finally registering the results of the vaccinator's proceedings.

The parents or guardians of vaccinated children should be made responsible for their appearing before the inspector on the appointed days.[1] Those who avail themselves gratuitously of the national provision would be required to meet him at stations or other appointed places, and at stated times, under penalty for non-attendance, unless sufficient reason were given. Those who are vaccinated by private practitioners would have either to appear at the inspector's office and to pay a higher fee—say 2*s.* 6*d.*—for inspection, registry, and certificate; or, if any should prefer being visited by the inspector, to remunerate him for calling upon them, according to a regulated scale of fees. In a population of 70,000, which I assume might be the average for the district of a Sanitary Superintendent, there would probably occur, under an effective system of vaccination, about 1,800 cases, public and private, annually; and the inspector's fees would therefore amount to

[1] It has been said that inspection by another officer might interfere with our present system of eighth day visitation by the vaccinator himself, which provides for the weekly presence of a lymph supply at the station when and where it is wanted. But this objection appears to me to be merely nominal. There would be no practical inconvenience in the simultaneous visits of the vaccinator and inspector, each having a distinct duty to perform. On the contrary, the two officers would have the opportunity of rendering mutual assistance, and, in case of the unavoidable absence of either, the other would be at hand to arrange with the people for the future completion of the postponed duty.

nearly 100*l*. This, it must be confessed, would be a very economical outlay for a most real and complete security for efficient vaccination.

2. There is another public function—noticed in the last paper—which might be beneficially committed to a District Sanitary Superintendent,—I mean the examination of articles of food, drink, and medicine suspected of adulteration.

Yet I admit that this function might be as well treated separately, and committed to a public analyst, appointed to a county or a very large district.

So prevalent are fraudulent adulterations of the necessaries of life; so extensive is the injury which they inflict (often secretly) upon the health, nourishment, and vigour of the people; so disgraceful to the commercial character of the country is their notoriety; so completely is the consumer a the mercy of the dealer or manufacturer; so utterly unable are the working classes, at all events, to protect themselves against the ingenuity of fraud,[1] that anyone ignorant of the obstacles to corrective legislation in this country would be at a loss to account for the hesitation of Government and Parliament to adopt decisive measures for the public safety and credit, more especially as the urgent necessity for some enactment was declared in 1856 by a committee of the House of Commons, whose clear and comprehensive report might well have been followed by prompt legislation.

The real point, however, for present discussion is, whether such legislation might not, in the first place, be limited to a few effective provisions for detecting adulterations and publishing the results of analysis, with the names of offenders.

A measure of this kind need in no way interfere with the freedom of commerce, while it would afford consumers just

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[1] 'The poorer the district, the greater the amount of adulteration.'—Parliamentary Report, 1586, p. 4.

that information which would fairly enable them to act on the well-known maxim, *caveat emptor*.

The infliction of penalties—fines and imprisonment—might be deferred for future enactment, if that be found necessary, which I doubt.

By what official machinery, then, should these falsifications of food be detected? The parliamentary committee rightly decided against leaving examinations of this kind to Excise officers and analysts appointed by the Board of Inland Revenue.

It seems clear also that two orders of public analysts should be instituted—one consisting of local officers, acting in appointed districts, and competent to conduct the more ordinary examinations; the other of a few eminent specialists, acting for the whole of England and Wales, and habituated to intricate processes, who might be consulted in what are felt to be very difficult cases, as well as in appeals against local decisions.

A great majority of the inspections could doubtless be satisfactorily managed by any well-instructed analysts and microscopists. The parliamentary committee, however, very wisely suggested the reference of certain important and delicate cases to officers appointed by the Privy Council. But Mr. Scholefield's last bill, as amended in committee, is open to these grave objections:—First, it assumes, strangely and I think irrationally, that in case any local board should determine to put the Act in force, a thoroughly competent analyst will be found ready for office on the spot; and, secondly, it leaves these appointments unconditionally to the local boards, not a single security being taken for testing the qualifications of the candidate, or for protecting him when appointed in the independent exercise of his most arduous duties. The analyst, even if not an ignorant or unpractised man, would hold office merely at the pleasure of the majority or of

an influential clique of the local board, which might contain, for aught we know, the principal adulterators of the place.[1]

The Birmingham measure, for these reasons, is, I fear, a delusion. If allowed to become law, it will be another obstacle to normal legislation; it will create another class of interests—official and professional interests—opposed to fair and searching inquiry; it will open a new field for municipal jobbing, and afford another plea for central dictation.

Far better in every respect would it be to make use of the simple though effective organization proposed in this paper. The Sanitary Superintendent might himself act, in some places, as the analyst of the district; whilst, in other places, these examinations might be made by a distinct officer, specially qualified, and with similar securities for efficient and independent action.

The poor should be encouraged to apply gratuitously, at proper times and with due notice, for the examination of any purchases or supplies of food which they believe to be adulterated or unwholesome. Other persons would be entitled to similar information on payment of small fees and costs.

Not only food of all kinds, beverages, and medicines, but also mineral products, soils, manures, and other articles of commerce, would be brought for examination to the district office of public health.

Local authorities and magistrates should be empowered to order the analysis of any public supplies—water especially. Proved adulterations and impurities should be published at the analyst's office and in the local papers.

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[1] A first-rate microscopist of this town, to whom I expressed a wish that he were appointed histologist for the district, replied, 'I would not accept such a post so long as I depend on my profession for an income. I could not afford to incur the hostility of the food-selling inhabitants of the place.'

This public officer ought certainly to receive a fixed salary. For the sake of illustrating my principle, I may say not less than 250*l.* for a district of the proposed population.

[1874.—In subsequent papers, after observation of the results of recent sanitary legislation, I show that the office of public analyst should in most cases be distinct, and unconnected with that of health officer, and that the analyst should be appointed by county authority.]

3. Toxicology naturally pertains to the office of a public analyst, and leads us on by a plain connecting link to a third function of paramount importance to the public safety, which I propose to deal with in the same manner.

Dr. Farr has left us no room to question the necessity of far more accurate information than we now possess respecting the causes of sudden and violent deaths. Reliable statistics show that a very large proportion of such deaths pass the ordeal of a coroner's inquest without a record of those 'particulars' which the Registrar-General requires of coroners for the purposes of correct registration. He has also shown that these particulars of information are unattainable without medical inspection and report in aid of the legal inquiry.

Medical jurisprudence, as a special branch of practice, is scarcely recognised in England; for the occasional employment of this or that eminent professor in courts of law does not amount to a national recognition of his office. The State troubles not itself to secure a high standard of education and a thorough practical training for those who, if fully qualified, might be statedly employed, with incalculable advantage to the public, in forensic inquiries. The supply of scientific evidence—chemical and pathological—in coroners' inquests and courts of assize is abandoned to chance. Any one may act as medico-legal referee for the nonce at the will of any lawyer practising in any court; and, as an almost inevitable result, the physical sciences are not seldom sub-

jected to extraordinary perversions, and the medical profession to needless humiliation, by the performances of its members in the witness-box. In the absence of persons specially qualified and experienced, medical practitioners are called away from their ordinary multifarious engagements, and too often appear in court rather as partisans of a cause than as philosophical expounders of obscure and terrible events. If human life is to retain the comparatively high value which has been so nobly set upon it in England; if every strange and suspicious death is to be submitted to a rigid, complete, and costly investigation; if the principle of popular co-operation in our inquests is to be maintained; and if, at the same time, our forensic medicine is no longer to excite the astonishment—sometimes even the ridicule—of intelligent foreigners, science must be systematically brought to bear upon the legal process.

Now, the machinery suggested in this paper is precisely calculated to meet the administrative difficulty and to supply the public want. Those subjects which would chiefly engage the attention of a Sanitary Superintendent of mortuary registration are hardly to be separated from the study and practice of forensic medicine. The cause and manner of every sudden death brings the preventive and the medico-legal functions into close co-operation. No theoretical distinction between medical jurisprudence and hygiéne deserves serious notice in administrative arrangements.

I may be allowed to support my views by a quotation from the same judicious authority to whom I have already referred:—

'Without an examination of the organs of the body, and often without an analysis of their contents, the cause of death cannot be determined, either negatively or affirmatively. And this examination would be most satisfactorily conducted by one medical officer in each district, who would become

by experience expert in manipulation and sagacious in judgment. He might undergo, before his appointment, a special examination in medical jurisprudence, and be very properly the health officer of the district.'[1]

We may therefore safely conclude that, together with other much needed reforms in the coroner's office and court, many of which are recommended both by Dr. Farr and by the learned body of coroners themselves, an expert in medical jurisprudence and toxicology ought to be appointed in each of the districts which it is proposed to commit to a Sanitary Superintendent of Registration.

There are engagements of a medico-legal nature, not relating to sudden or violent deaths, which must not be forgotten in this sketch. The medical referee might have to inquire and report on alleged personal incompetence—whether moral, mental, or physical—for the fulfilment of public or family duties, or of labour contracts, and to detect malingerers. He might have to protect extreme youth, perhaps also extreme old age, by examination and certificate, from illegal compulsion to work. He might have to inquire into the nature and extent of personal injuries caused by mechanical violence, by unprotected machinery, by accidents in mines or in public conveyances; or resulting from brutal assaults incited by hatred, by lust, by intoxication, or by wanton savagery; many of these injuries, like ordinary cases of sickness, ending not in the death of the sufferers.

4. Three orders of official experts would be required under a normal system of medical jurisprudence; the first, as now suggested, for coroners' inquests and local investigations; the second, consisting of men of higher standing, for the circuits of assize, and for inquiries of a more extended scope

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[1] Dr. Farr's letter to the Registrar-General on 'Suggested Improvements in the Coroner's Inquest.' Nineteenth Annual Report of Registrar-General, 1858, p. 205.

and design; the third, a central committee of eminent toxicologists, medical jurists, and psychologists, to aid the metropolitan courts and to report on appeals from the provinces.

It will at once appear to every well-informed person, that I am recommending neither the French nor the German system of legal medicine; although there are features in both which deserve unprejudiced attention, and might perhaps be adopted, with some modifications, in this country.

As to the remuneration for the district medico-legal office. All the reasons which have been so fairly urged by the coroners, and never, I believe, refuted, for commuting the casual and precarious fees of their ancient office into a fixed stipend, apply with equal force to a stated salary for the medical referee; and for the sake of completing my hypothetical estimate of expense, I may name 200*l.* as an average annual payment for these duties, in a district of the proposed extent.

5. I have now completed my description of four sanitary offices—statistical, supervisory, analytical, medico-legal—all of them subjects of pending legislation; and I have shown that a moderate stipend for each function would raise a total salary of about 950*l.*; a sum which might have to be divided between a Sanitary Superintendent and a Public Analyst or Medico-legal Officer. This amount I consider to be the minimum which would suffice to place the office-holders in a position corresponding to their superior qualifications and weighty responsibilities, and justify their absolute restriction from private medical practice. Nearly half of the above salary would, on my plan, be paid out of the Consolidated Fund; the remainder principally by local taxation, and the county rate, for obvious reasons, would be a more equitable and convenient source than the parochial or district rates.

6. It has appeared to me unnecessary to touch upon the ordinary duties of a health officer, the remuneration for

which would *not* be included in the preceding estimates. Some of these duties would fall, as a matter of course, to the proposed Sanitary Superintendent. They are well known to this audience. Some are specified in Acts of Parliament; and all that strictly belong to the office, in its present condition, are comprehensively, yet concisely, stated in the Instructional Minute of the late General Board of Health (Dec. 20, 1855), then under Mr. Cowper's presidency. I consider this to be our best summary of the purely hygienic duties of the officer of health; but I venture to suggest that some two or three of the details of that 'Minute' properly appertain to the medical visitation of districts smaller than it is desirable to commit to the officer in question. For instance, regular inspection of the dwellings of the poorer classes, whether common lodging-houses, cottages, or apartments, with reports thereon to the local board and sanitary advice to the poor occupiers, is or ought to be the business of the medical officers of parochial districts, and need be referred to the superintending health officer only in disputed cases, or by way of appeal. Whenever the department of medical attendance on the poor is placed upon its right footing, it will assume a sanitary and preventive character, and the officers will prove most valuable aids and deputies to the health officer of a larger sphere of duty. The medical-relief corps also would in time supply the most eligible candidates for vacancies in the appointment of Sanitary Superintendents.

A full programme of the details of district sanitary inspection would theoretically include certain matters not at present under legislative consideration. I pass them by purposely, as I wish to avoid everything which might startle the cautious or excite needless difference of opinion.

7. There is, however, one unperformed public duty which calls for notice at this time and place.

The working of the new 'Medical Act' has shown the necessity for some recognised local agency to aid and correct the registration of medical practitioners. The Medical Council is not only without power to prosecute for offences against the Medical Act, but it has no local machinery for scrutinizing and verifying the claims of applicants for registration. Organized co-operation with the metropolitan Medical Registrar is neglected in most districts. In some towns it is attempted by medical societies, self-formed for this purpose; but when these associations enter upon a course of rigorous action in defence of professional interests, they are in danger of degenerating into a sort of small courts of inquisition for the suppression of medical heresies; and in that case they would inevitably excite the jealousy of the public, and fail in the really useful object of their institution. Accuracy of record and periodical correction of the Medical Register will be most satisfactorily attained by entrusting local inquiries and proceedings, under the Act, to the official superintendents, whose various functions are the subject of this paper.

8. The duties and responsibilities of a superintendent officer of health ought to be such only as obviously belong to a jurisdiction of practicable extent, and as might be discharged conveniently by a superior local or county authority. Wider and higher functions of observation and comparison, such as would be exercised over several counties, and involve authoritative advice and frequent communication with the Privy Council, belong more appropriately to Government inspectors; say, one for each of the ten extra-metropolitan registration divisions of England and Wales, in official relation with the health officers or sanitary superintendents. There are, moreover, some special institutions and regulations which might demand the undivided attention of itinerant inspectors for the whole kingdom. Several

examples of this method of supervision, perhaps more than enough, are to be seen in operation among us. Probably, there may be too strong a tendency to create special offices, and to isolate inspecting duties, in cases where the public would be gainers by consolidating them. But I avoid entering into details upon this point. My principal object in referring to general inspection is to distinguish it from local superintendence. The latter, in my opinion, should neither be so minute as to interfere with existing arrangements for the medical care of districts, nor so extensive as to supersede ineffectually a higher kind of inspection.

9. Finally, to anticipate a probable objection to the general project of sanitary officers, advocated in these papers. It may be said that an attempt to combine so many different employments in one office, or even in two offices, is likely to fail, owing to the great difficulty, if not impossibility, of obtaining candidates who would possess the requisite variety and extent of qualifications.

I admit that this objection would be valid and the difficulty insuperable, were it proposed at once to organize a corps of such officers for the whole country.

But my object, I repeat, is to introduce the reform gradually. In this, as in all other matters, a demand would in time create a supply; and a sufficiently numerous body of learned and skilful men would in the course of a few years be duly prepared to fill vacancies as they occur, and to undertake the extended responsibilities of the appointments.

We may, after all, grant that a thorough knowledge of physiology as regards living forms generally,—of pathology in the same wide signification,—of chemistry, organic and analytical,—of natural philosophy, geology, and meteorology,—and of statistical processes and results, would rarely co-exist in the same officer adequately with other indispensable moral and mental qualities; and therefore that,

wherever facilities offered, the various employments might be advantageously divided, in order to secure the more complete fulfilment of the several objects contemplated. I admit that this separation is especially proper in the department of analytical chemistry. But we shall all agree that no one form of organization can possibly ensure universally a perfect administration. We must accept the nearest approach to the *beau ideal* which the intellectual and material resources of the nation can supply, and which the social peculiarities of the locality will admit.

Now, to apply these axioms and postulates. In a very populous district, containing, say, more than 150,000 inhabitants within a manageable area, it might be better to divide the several occupations between two officers, entrusting to one the inspecting[1] and the statistical, to another the forensic and the analytical.

But in a vast proportion of districts I believe it will be found that a general acquaintance with the natural sciences, official aptitude and experience, power to call in further technical aid or to refer any disputed point to a metropolitan board, and liberty to accept the local co-operation of persons more profoundly versed in specialties, are conditions which might render one scientific appointment more beneficial to the public than the creation in the same place of several offices, which, from the very circumstance of their number, must be inadequately endowed.

10. The principal requirements of the improved organization which I recommend are:—

First, a comprehensive education, practical training, and strict examination of candidates for sanitary office.

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[1] If the regular inspection of vaccinations should prove to be too onerous an addition to the multifarious duties of a health officer, it might be entrusted to his deputy, who might be one of the medical-relief corps of his district.

Secondly, a proper performance of many unfulfilled or imperfectly executed, yet most necessary, public duties.

Thirdly, the consolidation of certain allied functions, instead of their fragmentary, expensive, and inefficient separation among several classes of agents.

Fourthly, the prohibition of private medical practice to public superintending sanitary officers.

In carrying these principles into operation, it may appear desirable, as I have admitted, to double or treble the extent of a sanitary district in some localities, and to furnish its official superintendent with one or more scientific co-adjutors.

Safe and true principles of administration admit of easy adaptation to local differences and to the various circumstances of a people.

11. Having, I hope, met the more practical criticisms to which my propositions may be open, I need hardly dwell upon possible objections of a merely theoretical or æsthetical nature. Yet a few remarks seem to be due to those who hold that sanitary regulations do not come within the province of Government, and that systematic legislation for the public health is an improper interference with personal freedom of action.

The opposition of this school appears to me to depend mainly on their ignoring the distinction between PERSONAL HYGIÉNE, or the voluntary action of individuals in the preservation of their own health and that of their families; and PUBLIC HYGIÉNE, or the legal action of society, by sanitary institutes, for the welfare and security of the public.

Every one fairly instructed in the first elements of physiology and the simpler precepts of health, is responsible to his Maker and himself alone for the neglect of those maxims and precautions which are strictly personal and in no way affect the well-being of his neighbour. But

laws for the protection of the public health are a necessary condition of civilization, binding each member of the community by the good old rule, *sic utere tuo ut alienum non lædas*. Every citizen is thereby made responsible to the State, and surrenders for the general good a portion of his natural liberty, as the price of his share of the advantages of brotherhood and nationality.

12. On the other hand, it would be utter waste of time to notice the shallow declamation and smart sophisms which I have seen aimed at well-considered projects of medico-sanitary organization. What need one reply to such epithets as utopian, un-English, centralizing, despotic, &c.? Applied to rational administrative reforms in a country where the local element of government greatly preponderates, and where the central executive is strictly responsible to Parliament, they are as—

> . . . . . a tale
> Told by an idiot, full of sound and fury,
> Signifying—nothing.

Unfortunately this verbiage tells with an unthinking multitude; and the result, as Mr. Ruskin eloquently describes it, is—a population which 'resists every effort to lead it into purity of habit and habitation, to give it genuineness of nourishment and wholesomeness of air, as a new interference with its liberty, and insists vociferously on its right to helpless death.'

Every teacher of great truths must reckon upon this sort of opposition; but the wise and hopeful sanitary reformer will not be discouraged. He will not cease to propound and defend—forbearingly yet unflinchingly—those principles of public action which he believes to be of fundamental importance in sanitary management. Nevertheless he thankfully accepts from those in power such instalments of a better system as are possible under existing circumstances, and are not incompatible with future progress in a right

direction. Cautious and far-sighted, however, he does not hesitate to reject unsafe concessions, founded on no sound principle, even though plausible and attractive; for well he knows that they tend to create future impediments, to conceal or to protect present abuses, and to strengthen the hands of the obstructive and reactionary.

His motto is 'Progress.' His means,—impartial, scientific, and comprehensive inquiry; skilful compilation and truthful publication of facts in every district; unsparing exposure of abuses; systematic instruction of the people by qualified teachers; enlightened administration of wise laws. His ends,—the health and longevity of the people, aiding their moral improvement, confirming the obligations of social order, strengthening the foundations of public liberty, and thus promoting the lasting peace and happiness of his country.

III.

A DEFENCE OF THE PRECEDING PAPERS, WITH ADDITIONAL STATEMENTS AND ARGUMENTS IN SUPPORT OF THE PRINCIPLES THEREIN ADVOCATED, AND OF A SCIENTIFIC ORGANIZATION FOR SANITARY PURPOSES.

(*Reprinted from 'Public Health—The right Use of Records founded on Local Facts.'—London: Parker*, 1860.)

1. My chief object in these papers has been to promote the adoption of a more rational, trustworthy, and efficient system of public inquiry and record than has yet been applied to the SICKNESS and MORTALITY of the population of Great Britain; so as to ascertain the prevalence as well as the fatality of diseases of different kinds in every town and district, according to sex and age, and under each of the more notable conditions and occupations of this industrious people.

I have endeavoured to show the necessity for more accurate and impartial information respecting the CAUSES of disease in general, and of epidemics in particular, indicating their periodical variations, their climatic relations, their modes of diffusion, their physical and social concomitants.

2. Within the last thirty years much has been said and written about the causation and prevention of disease. It is a subject beset with natural and social difficulties, and rendered yet more perplexing by irregular controversy. Scarcely one of its vexed questions has been settled, or is even fairly in the train for solution. Positive assertions, it is true, are made in abundance,—their vehemence being just in proportion to the ignorance of those who make them. We look in vain for any established laws of ætiological science. Nor is this barrenness of result to be wondered at, when sanitary

inquiries have been too often promoted, less for the sake of carefully noting, verifying, and grouping facts on the largest scale, than with the design of supporting some favoured theory or maintaining some foregone conclusion; less with a view to determine the nature and relations of these phenomena—regardless of consequences in the search for truth—than for the purpose of justifying some predetermined 'sanitary' measure. When evidence is selected, when the orthodoxy of reporters is secured, when nothing contrary to the views of the official promoters is suffered to transpire, it is but natural that independent observers and original thinkers should prefer an appeal to the public, and thus appear in opposition to the official ranks. On the other hand, it is not surprising that those reports should be most favourably received by persons in authority, which least threaten to disturb the routine of departments or to ruffle the self-complacency of corporations and local boards, and which are least likely to shock the sensitive nerves of any great commercial or manufacturing 'interest' by disagreeable revelations concerning its industrial pathology. If the people, the press, and the Parliament of Great Britain prefer an authorised tampering with the very foundations of preventive medicine; if the cry is to be—peace, peace, when there is no peace; if those only are to be heard who prophesy smooth things, then, indeed, it is a mere waste of time to advise a scientific organization, independent as well of corporate as of political influence, for the purpose of investigating and recording in every district the diseases which afflict its inhabitants. But I cannot believe that the nation and its representative Government are determined either to refuse authentic information or to reject conclusions which may be fairly drawn from it; and therefore I ask that the evidence given to the public touching matters of public health shall be the truth, the whole truth, and nothing but the truth.

3. With regard to the statistics of disease, it would be difficult to devise machinery more suitable, as far as it goes, for noting, collecting, and distributing truthful information, than that which is actually ready for our use. In the established registration system we possess an organization co-extensive with Great Britain, in full and effective operation. It merely needs the grant of additional powers, with the exaction of additional duties by skilled agents, and, above all, *competent local supervision*, to fit it perfectly for our purpose.

If complete records of sickness and mortality were compiled and published in the several registration districts, by a legally-constituted order of men, of superior education and large medical experience, habituated to scientific processes, and in respectable position, any serious misuse of evidence, any deliberate concealment or perversion of facts, would be next to impossible; while the number of recorders and the universality of their jurisdictions would furnish the necessary corrections for occasional or individual errors. Under such a system, certificates would be no longer accepted from unqualified practitioners; for the medical superintendent would possess just that information with regard to professional qualifications which the present Registrars are neither compelled nor assisted to obtain.[1] No longer would it be possible for Dr. Farr to admit that only 83 in 100 of deaths throughout the kingdom were certified by the medical attendants;[2] and that in one quarter of a year nearly 22,000 deaths were returned without *any* authorised statement of the 'cause.' Many thousands of sudden deaths, in which incomplete coroners' inquests now fail to determine the cause, would be

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[1] See Mr. Horace Mann's letter. *Medical Times and Gazette*, May 19th, 1860.

[2] See Dr. Farr's speech. 'Transactions of Social Science Association.' Vol. iii. p. 616.

subject to autopsy, by direction of a superior medical officer, to whom both magistrates and coroner would defer.

Again, the registrars of births and deaths, the medical certifiers of causes of death, and the officers of public institutions would make their returns under a responsibility at present wholly wanting. The proximity of a scientific supervisor would be the preventive rather than the corrective remedy for avoidable mistakes. We should no longer be able to quote a medical certificate that somebody's death was caused by 'want of vitality,' or another's by a 'worn-out stomach' (*facts*). There would be far less probability that diseases of the epidemic or zymotic class would be confounded with diseases of particular organs, or that the equally important distinction between constitutional or blood disorders and those directly caused by external agencies would be ignored. A case of pneumonia would rarely be certified as typhus, or a death from scarlatina as the effect of a secondary dropsy. Scrofula would oftener escape the euphemism of simple 'abscess' or 'ulcer.' Disease of the heart—a most uncertain term—would less commonly stand for the rheumatic fever, on which it depended.

4. The inherent difficulties of the nomenclature of diseases are indeed vastly increased by a recondite nosology. A classification, such as that of the Registrar-General, must lead to innumerable perplexities, and tend to vitiate statistical conclusions, even though the science displayed in medical certificates may come up to the average level of pathological acquirement, and this cannot be expected under the present imperfect arrangements.

Attempts to improve the certified statements of fatal diseases and the scientific evidence given at inquests or in courts of law, have been represented as an absurd striving after an ideal but impossible perfection. Granting fully that it would be most unreasonable to look for perfect reports

under any general system, yet to oppose measures clearly tending to secure a minimum of error, because, in the nature of things, abstract truth is unattainable, I consider a more culpable absurdity. Without pretending that the leading facts of sickness and mortality can be recorded and grouped with entire accuracy, I hold that a much nearer approach to perfection is possible, and, under the improved organization suggested in these papers, more than probable. An amount of scientific information, which it would now be idle to expect, might then characterize the medical statistics of the kingdom. Not only the superintending officers, but every inquirer, thus aided, would be able to trace fatal cases from the beginnings and earlier stages to the final manifestations of disease.

5. Most erroneous I deem the assumption that the last phenomena of mortal disease may be correctly reported as the 'cause' of death. They are in general but the penultimate effects of the real cause, or at most the last link of a chain of secondary causes. A public registration of sickness would provide the natural and obvious means of correcting and completing simple statements of apparent results, often certified as the 'cause' on a cursory view of the dying or the dead. In crowded manufacturing districts, deaths are continually occurring, to which the medical certifier is summoned barely in time to witness the Hippocratic face, the cold drops on the livid forehead, the last agonies of life. In many a case the disease, or rather the series of disorders, has been treated only by some bold druggist, or ignorant herbalist or quack. Worse still, it is too often the mere expression of the very treatment—regular or irregular—to which the patient has been subjected. In thousands—especially among the infants of factory workers—it is the direct consequence of maternal neglect, if not of slow alcoholic or narcotic poisoning. Violence, crime, intemperance, privation,

congenital infirmity, syphilis and hereditary taint, are more frequently the real causes of a mortality which, from want of information about anterior disease, is attributed to various secondary complaints. If these causes might be referred to certain evil conditions of society, so might the fatal diseases themselves be frequently traced to over-crowding, to dwellings of unspeakable foulness, to sites most pestiferous,—ulterior causes which need never have existed, or might long ago have been removed, and which, having been tolerated, have prostrated each victim as surely as if his unshielded breast had been struck by the murderer's knife.

Do the reports of the Registrar-General display the frightful agency of these social wrongs, or leave on record a trace of their origin?

A score or two of commonly certified 'causes' of death might easily be cited to show that they mean nothing more than the modes of death, affording hardly a clue to the real nature of the primary disease;—but they are necessary until we possess reliable records of previous sickness.

The certificates may be correct enough as far as they go. There may be no error in diagnosis, for there is often no opportunity for diagnosis, properly so called. The last hours of the ebb-tide of life are not the time for scientific diagnosis. We might almost as well look to morbid anatomy alone for a knowledge of morbid symptoms. We might as well expect ætiological instruction from the corpse inspections practised in many continental towns. They were never intended to supply such information. Yet, strange to say, this acknowledged defect in foreign mortuary returns has been urged, even by sensible persons, as a reason for not instituting a more reliable though less intrusive method of inquiry and report in this country. It has seemed to me, therefore, of some importance to ascertain the real scope and object of the

French and German regulations, and the efficiency of their systems; and I have added, by recent inquiries, to the information I obtained on this subject some years ago.

6. In France the law for the civil registration of births, deaths, and marriages is most precise. It is characterised by very careful provisions for proving personal identity, and for purposes of police and legal process generally. The primary duty of record is performed in each commune by the *Officier de l'Etat Civil*, who is also the mayor of the commune, or his deputy. Leaving, at present, the greater part of a good account of the system given to my friend Dr. William F. Ramsay by M. Battel, in which there is much to interest the statesman and the lawyer,[1] I merely direct attention to those regulations which relate to the registration of deaths.

No burial may take place without an authorisation given, free of charge, by the *Officier de l'Etat Civil*, who cannot furnish it until he is himself satisfied of the fact of death. Practically, however, instead of verifying the death himself, he commits this duty to a physician—a custom permitted, though not directed by law.

In Paris and some other large cities there are physicians specially appointed and paid by the municipality to certify deaths—*Les Médecins Vérificateurs*. These do not, however, perform the duty in hospitals, &c. Burial cannot take place until twenty-four hours after death. Permission to bury is granted as soon as the death is verified. In certain cases, as in deaths from contagious disease and in premature decomposition, interment is allowed within twenty-four hours. When there are indications of violent death or other suspicious circumstances, burial is forbidden until an officer of police, assisted by a doctor of medicine or surgery, has drawn up a

[1] A translation of M. Battel's paper was contributed by Mr. Alfred Aspland, in a very able communication to the Manchester Statistical Society, Jan. 1861. This paper deserves careful perusal.

procès verbal of the condition of the corpse, and of the circumstances relating to it. It may then become a matter for forensic inquiry, on which I need say nothing here.

The registration (*acte de decès*) must in every case be made by the *Officier de l'Etat Civil*, on the declaration of two witnesses, males, not less than twenty-one years of age. These declaring witnesses are, if possible, to be the two nearest relatives or neighbours, or, where the deceased is at a distance from home, the persons in whose house the death occurs. The simple *acte de decès* is confined to a verification, first, of the fact of death, and secondly, of the identity of the deceased. Circumstances which may have preceded or accompanied the death are not to be mentioned, 'lest the report should perpetuate the memory of deeds which might cast a stain on the honour of the family.' Such a regulation under a despotic or revolutionary government might, I conceive, lead to the suppression of facts of serious moment to personal and public security.

The entry in the register is to contain, 1st, the *prénom*, name, age, profession, and residence of the deceased, stating whether single, married, or widowed; 2ndly, if possible, the same particulars respecting father and mother; 3rdly, the birthplace. These particulars are ostensibly for the purpose of identifying the deceased, but they are also of great importance in tracing the causes of mortality. In England, as we know, deaths in hospitals, workhouses, and other public institutions are returned as belonging to the district in which they occur. In France there is a better arrangement. Notice of every death must be given by the resident officer or manager, within twenty-four hours, to the *Officier de l'Etat Civil*, who, after verifying the fact by a personal visit, must draw up and forward a report thereof, with the evidence, &c., to the *Officier de l'Etat Civil* of the last home of the deceased, who transcribes it on *his* register. The death is

therefore carried to the account of a locality which has generally much more to do with its causation than the locality in which it chanced to occur; and as the birthplace is also recorded, the public registers contain all necessary materials for a thorough investigation. This we need in England. I am informed, through the kindness of Dr. Daremberg, that the *Médicins vérificateurs*, in the municipality of Paris, are not only required to attest the fact of death, after careful examination, but they are also directed to obtain information respecting the nature of the fatal malady, its antecedent causes and accidental complications, its duration, the name of the person who treated the case, and other particulars. To what extent and with what degree of accuracy this information is recorded, I have not yet been able to ascertain. But an important 4to. volume, entitled 'Récherches Statistiques sur la Ville de Paris,' which has just issued from the press, under the direction of M. le Baron Haussmann, *Préfet* of the Department of the Seine, contains (at pp. 665–670) a classification of the deaths which occurred in Paris during the three years 1854–6, according to their alleged 'causes.' The tables specify the number of persons dying from each cause in private houses, in hospitals and hospices, and in prisons. This appears to be the first public use made of the scientific observations reported by the *Médicins vérificateurs*. I hardly need comment upon the Parisian classification of diseases and other causes of death. It differs considerably from that of the Registrar-General. A cursory inspection of the tables is, however, sufficient to show that diseases, essentially the same, must often be returned under different heads, and for practical purposes a bolder combination of details would be preferable. The duty of the *Médecins vérificateurs* in the provincial departments of France is limited to confirming the fact of death, and if it should appear to them to

have been other than natural, they are bound to give immediate notice of their suspicions to the authorities.

7. We turn to Germany. Professor Müller has favoured me, through the Generalin von Hartmann, with very recent information and valuable statistics from Hanover and Berlin. I find that no important alteration has been made in the system since Rönne and Simon gave a full and exact account of the mortuary registration and other medico-sanitary regulations of Prussia in 1846.

Every death must be reported to the minister of the parish. Jews and dissenters deliver their notices to the magistrate. There is no national law requiring inspection of the dead by scientific officers, except in cases which demand legal investigation; nor are physicians generally appointed as inspectors of corpses. The *Todtenbeschauer* of Austria does not exist here. But in a few principal towns the local magistracy appoint medical officers for this purpose, the objects being simply to prevent either undue detention or premature interment of the corpse, and to direct sanitary precautions during epidemics. The cause of death is always registered, but not necessarily on medical authority. A report from the relatives is accepted in the absence of one from the attending physician. A formal certificate of the nature of the fatal disease, not being legally required, is rarely given. The 'causes' are roughly distributed in twelve classes:—(1) still-born, (2) debility of old age, (3) suicide, (4) sudden accidents, (5) child-bed, (6) small-pox, (7) hydrophobia, (8) *acute* internal diseases, (9) *chronic* internal diseases, (10) apoplexy, (11) external injuries, (12) unspecified. Here is no pretence to a scientific nosology. The law demands scientific report on the cause only under suspicious circumstances.

Copies of the parochial registers are forwarded to the local civil authorities—police boards, or town magistrates, or

crown officers, as the case may be. These again transmit them to the provincial boards or to the *Landrath*, from which they are forwarded to the Statistical Bureau of the metropolis, where they are printed and published.

The replies from Hanover, with which I am favoured by Herr Amtsrichter Dr. Siemens, describe a system very similar to the Prussian. The parochial clergy, as in the north of German generally, are the registrars, while the completeness and accuracy of the register for civil purposes are secured by legal enactments. The law does not prescribe inspection of the dead by a physician or surgeon, and no such inspection takes place in the majority of deaths, especially in rural districts. Scientific returns therefore are not attempted, but the parish minister must report the manner of death (*Todesart*), the age, civil condition, and creed of the deceased. A medical certificate of the nature of the fatal disease is quite as rare as an inspection of the corpse; and neither is decreed by law. A classification of 'causes' somewhat like that of Prussia is adopted. The collection, revision, and compilation of vital statistics are on a system strictly analogous to that of Prussia.

In the southern states of Germany greater scientific accuracy is attempted, though seldom attained.

The regulations in Baden are remarkably precise and methodical.[1] Medical inspection and report are enjoined in every case. An officer to be appointed for the purpose in every town and parish. Towns containing more than 6,000 inhabitants to be divided between two or more medical inspectors. The registers to be kept by these inspectors. A copy of each register to be forwarded to the *Bezirk-staats-arzt* (district physician) at the close of each year; and an abstract of the register to the Sanitary Commission, which, after

[1] See Rohatzch. 'Medicinal Polizei.' Augsburg, 1846.

revising and verifying it, is to forward it to the Government with other reports affecting the health of the district.

Each entry of death in the register is to include, among other particulars, the cause, the duration of the fatal illness, and whether or not attended by a medical practitioner; and in the annual summary returned by each town or district, the deaths, male and female, are to be classed under five heads: (1) acute diseases, (2) chronic diseases, (3) external diseases, (4) accidents, (5) suicides. There is a column for the number dying without medical attendance, and one for the deaths in each of six periods of life.

In Bavaria, whatever may be the law at present, the practice in 1846 was reported by Rohatzch to be very defective. Inspection of the dead was not regularly performed. In the poorer and remoter districts it was deputed to the *Landaerzte*, and even to bathers and barbers. Efforts were, however, being made to correct the want of uniformity, and to supply local defects of organization.

The Austrian system is more perfect, and in populous districts is tolerably well worked. Every death must be first reported to the local magistrate, who sends the *Todtenbeschauer*, a surgeon, to inspect the deceased. No clergyman is permitted to bury a corpse without a certificate from this officer, founded on a description of the last illness by the attending physician, or, failing that, on the evidence of relatives or friends, as well as on his own careful inquiry. Except in deaths from epidemics, or under particular circumstances, burial is prohibited within 48 hours. The duty of the *Todtenbeschauer* does not necessarily include a scientific report of the cause of death. All sudden, violent, or suspicious deaths, still-births in certain cases, and deaths happening under the treatment of quacks, are referred to a court of official physicians and surgeons—*Gerichtliche Leichenbeschau*. The German codes of medical jurisprudence and methods of

forensic inquiry in medico-legal cases, are greatly superior, on the whole, to those of this country.

8. The remarkable diversity with respect to the law and practice of mortuary registration which I have shown to exist among the principal states of Europe, and their general neglect of any scientific record of the causes of death, doubtless result in statistics inferior, medically speaking, to those of our Registrar-General. But an impartial examination of the various continental systems will suggest many improvements in our own. At all events, the fact of European failures is no fair argument against such a reform of the English arrangements as is advocated in the following papers —a plan which differs far more widely from any continental system than it does from that now in operation in Great Britain.

9. I now revert to my plan of including, with the registration of births and deaths, the statistics of all sickness attended under the Poor Law, and of that relieved by charitable and provident institutions, such, at least, as enjoy immunities from the State, or are in any way protected by law.

A public registration of disease is no new or strange demand. It was one of the 'twelve proposals by which the lives of many thousands of the rich as well as the poor may be saved yearly,' made to Parliament by a philanthropic gentleman, John Bellers, who wrote in the beginning of the eighteenth century, before the first of our modern hospitals was planned. It was again urged quaintly by Dr. Clifton, physician to the Prince of Wales, in 1732, with special reference to hospitals.[1] 'Private men,' said he, 'may labour and tug at it as much as they will, but they can never bring it to a bearing like the publick.'

[1] Clifton's 'State of Physick,' pp. 171–2, quoted more fully in my 'Essays on State Medicine,' p. 107.

The late excellent Dr. Walker, of Huddersfield, in or about 1834, recommended the appointment of a medical authority in each Poor Law Union, who, in addition to other important duties, should draw up annually a report of the health of the district, from the reports of union surgeons, aided by the returns of infirmaries and dispensaries. He wished also that the officers of medical charities, as well as union medical officers, were instructed to observe the same nomenclature and form of registration.[1]

A comprehensive plan for the uniform registration of the sickness which affects the poorer classes, embracing all public and social sources of relief, was suggested in my evidence before the Medical Poor Relief Committee of the House of Commons in 1844.[2]

In the inquiries which I was then pursuing, I was struck with the extravagant waste of time and labour by the hard-worked parochial surgeons, 'in mere pencraft, upon bundles of ruled paper, which served no higher purpose than that of economical checks upon poor-rate expenditure.' But I also saw that merely to make better use of the reports of sickness furnished by these gentlemen would be to leave unnoticed the greater part of disease occurring among the poor—its localities, circumstances, and causes unregarded. The immense proportion of sick poor relieved by others than the poor-law staff, especially in large towns, was therefore strongly represented to the parliamentary committee, in order to show that no partial measures could possibly avail either for statistical inquiry, or for medical science, or for economical administration.

For instance, to report the cases of the 5,600 pauper

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[1] See also some very striking remarks on the want of statistical returns of disease from our Medical Charities, by Mr. Baker, the Factory Inspector, in his Report on Leeds in 1843.

[2] Evidence, 9154, 9155.

patients of Bristol and Clifton in 1843, leaving unregistered those of the 17,000 poor who were during the same year relieved by the medical charities of that district, would be to convey a most erroneous idea of the sickness and infirmity actually prevailing among the masses of its population. Again, as to Liverpool. In 1843, 6,131 cases were treated as paupers, but no fewer than 64,112 cases were attended in the great infirmaries and dispensaries of that wonderful sea-port. Admitting that these are not average specimens of provincial towns, the returns, which I then collected and carefully compiled, showed that in eight large towns not under the Poor Law Amendment Act, in various parts of England, the mean ratio of pauper patients was as $7\frac{1}{2}$ to 100 of population, while the ratio of patients in medical charities was $8\frac{1}{2}$ to 100. Taking the mean of eight large northern towns under the Poor Law, the pauper cases were barely $2\frac{1}{3}$ per cent. of population, while the charity patients were $6\frac{3}{4}$ per cent. In Bath, the proportion was 4·18 sick paupers to 22·44 charity patients in 100 inhabitants.

An examination of the schedules appended to my evidence[1] might convince an impartial inquirer that the great medical charities of the kingdom ought to be included in any statistical system which may hereafter be applied to the sickness of the poor.

Projects of a more limited and special kind have been since put forward by others. Mr. Liddle, now health officer for Whitechapel, among many useful suggestions, in 1848, respecting the health of the poor,[2] proposed amended forms for the weekly medical returns made to boards of guardians, and their utilization in general sanitary inquiries. Again, the talented editor of the late *Sanitary Review*, in a well-

[1] These tables (corrected) were re-published in my pamphlet, 'Health and Sickness of Town Populations,' 1846.

[2] See 'Journal of Public Health,' 1848.

reasoned article (vol. iii. p. 317), showed how easily these returns, with a few obvious modifications, might be employed as a basis for the national registration of disease, especially in the record of epidemics. He proposed a Registrar-General of Diseases in London as the central authority, to whom the district returns, after local use, should be forwarded for digest and publication. This would probably be considered a needless creation of a new governmental office.[1]

The last proposal of the kind has emanated from Dr. Milroy. It differs not materially from its predecessors. It recalls to the sanitary statist the fact, that year by year at least a million and a half cases of sickness and accident—chiefly preventable, and due to 'circumstances not inseparable from mere poverty'—are reported to local boards incapable of applying them to their most important purpose. In his able paper, Dr. Milroy reproduces the questionable proposal that these truly national records should be compiled by an officer of the Poor Law Board; thus, on the one hand, isolating the statistics of pauper sickness from that of the poorer classes in general; and, on the other hand, encouraging the inference that an exceptional class, peculiarly liable to disease, may be taken as an average specimen of the morbility of the entire working population.

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10. A national registration of disease might readily include returns from friendly or provident societies,[2] sick clubs, and certain classes more or less isolated from the rest of the community; as, in prisons and penitentiaries; in the dockyards, arsenals, and other public works; in the revenue depart-

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[1] See my notice of Dr. Richardson's efforts in the following work, 'Fallacies of Vital and Sanitary Statistics,' III. p. 92.

[2] See remarks on the sickness of these Institutions in the next work, Ibid. II. p. 90.

ments and the police force; in mines, collieries, and factories; in asylums of different kinds; in schools maintained by endowments or aided by national funds. All these are in various degrees under legal inspection and public control, and might therefore be called upon to contribute to the common record their *quota* of facts for the public benefit.

It is no doubt a matter of some difficulty to determine the limits within which a State registration of diseases should be confined, especially in the outset. A distinction has been drawn between that sickness which is relieved by local or national taxation—as under the Poor Law and in Prisons, &c.—and that which is treated in institutions maintained, more or less permanently, by charity or by provident effort; as though the latter group were wholly independent of public aid, and therefore irresponsible. The assumption, however, is not strictly correct. In both public and provident institutions the sick are relieved by funds under legal protection. Their managers act under legal responsibility. Their rules generally may be enforced by law. They are, moreover, favoured by statutory immunities. Hospitals and Dispensaries are exempt from local taxation.[1] Enrolled Friendly Societies have been privileged by many successive Acts of Parliament, and they have been accordingly required to make periodical returns of their sickness and mortality, as well for their own safety as in acknowledgment of the advantages they derive from the State. They might, on the same just principle, be required to extend and improve the intelligence they supply to the public. Tabular forms might be prepared and printed by authority of the Registrar-General, and forwarded to every provident society and medical charity, with an offer of moderate remuneration to the secretary or clerk for making the returns. Then, and not until then,

[1] 1874.—This immunity has been unwisely abolished since 1866.

might the demand for information be enforced by penalty for non-compliance.[1] A distinct refusal—improbable enough—by the governors of any charity, or by the members of any enrolled society, to permit the forms to be filled up *at the public cost*, ought at once to deprive the recusant institution of the advantages it now enjoys by law. The hospital or dispensary withholding its statistics ought not to escape the payment of rates. The provident society objecting to furnish a periodical statement of its mortality and sickness to the District Superintendent should be liable to a suspension of its privileges and facilities of investment and legal process.

11. We may admit that even if all the diseases thus relieved and recorded were uniformly registered by competent authorities, a large proportion of sickness would still escape public notice, unless and until, by the voluntary co-operation of medical practitioners, the registration were extended to cases occurring in the higher and middle classes of society. This has been accomplished in Philadelphia (U.S.)[2] without the slightest breach of professional con-

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[1] A clause in the Registration Act for Scotland, and in the Registration Bill for Ireland, which compels medical practitioners to give *gratuitously* a scientific description of the cause of every death occurring under their care, under penalty of fine for omission, is a pretty specimen of the tyrannical treatment to which the medical profession is liable from the law-makers of this 'free' country. [1874.—This arbitrary enactment has now been extended, as I feared it would be, to England.]

[2] One of the leading physicians of that city, Dr. Henry Hartshorne, has devised, for the use of private practitioners, a simple tabular record, in which every case is to be entered at the time of the first visit, *by a single mark*, on a line opposite to the name of each disease or accident, printed in the first column. There are columns for the several periods of life, in one of which the mark is to be made. There are also two columns for the sexes; but it would be an improvement to omit these, keeping a separate form for each sex, and so saving the trouble of a second mark. The last column is for deaths.

The more usual diseases are entered on a monthly table, the rarer on a quarterly. I doubt the advantage of this arbitrary separation. With

fidence or violation of domestic privacy. So general an extension of the system must be the work of time, the result of patient and gentle efforts, in any country.

Again, we may admit that in the absence of a complete and universal record of sickness, all the materials would not exist for comparison with general death-rates. But both the diseases and the mortality of large portions of society might be ascertained; and merely because perfect records for the whole population would be unattainable for many years, it would be most unreasonable and impolitic to neglect the first practical steps towards so important an end.

Commencing with cases attended under the Poor Law, we might at once determine the district rates of sickness and mortality in that class of the community. The statistics of hospitals and dispensaries might soon follow. Almost all the required particulars—sex, age, occupation, condition or class, locality from whence admitted, date of admission, nature of disease, primary and secondary, duration of illness prior to admission, duration of treatment, and the result (whether cured, relieved, unrelieved, dismissed, or dead)—are at present to be found in the books of most well-managed hospitals. All we need is uniformity of record, and a public supply of tabular forms, so contrived as to facilitate statistical abstracts, and to enable the scientific inquirer to identify cases treated successively in different institutions. Many valuable suggestions have been made on this subject, but none of more practical utility than those of Miss Nightingale, who has thus added to her inestimable services in the cause of science and humanity.

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slight modifications, however, I believe that this record might be introduced into private practice, easily and successfully; and that in many districts the whole body of practitioners would co-operate in this way with a Sanitary Superintendent, who would supply them with forms. Dr. Hartshorne's record has been adopted by the Medical Society of the State of Pennsylvania, and recommended by its Academy of Natural Sciences.

12. The fallacy of assuming any fixed ratio between sickness and mortality has been fully exposed by one of our most scientific actuaries. 'The highest ratio of sickness,' says Mr. Neison, 'is sometimes found associated with a favourable rate of mortality.' (p. 410.)

Not only in particular societies, but in various employments and localities, the same discrepancy is observable. Bakers at the early and middle periods of life are less subject to sickness than the working classes generally, but their mortality is higher. Butchers experience a very high rate of mortality, though not subject to more than the average amount of sickness. So in Scotland, the rate of mortality is found to be much higher among the same class than in England, but the rate of sickness is actually below that of England. The 'sick time' of members of provident societies in this country appears to be steadily on the increase, notwithstanding 'sanitary' improvements.

Under the existing defect of system, the difficulty is great of even approximating to the real amount of sickness publicly attended in any of our large towns; but the 'Report on the Beneficent Institutions of the Metropolis, by a Committee of the Statistical Society,' has enabled us to form some idea of what was done in one year—1854—for the physical ailments of the London population.[1] In some continental cities, particularly in Germany, where *all* the sick poor are provided with medical aid at the public charge, the facts are more readily ascertained. Now, comparing the sickness thus

[1] Not less than 647,000 'cases' appear to have been relieved in the medical charities and by the parochial medical officers; besides an unknown number of private patients, sufficient nevertheless to maintain about 2,800 physicians and surgeons (see 'Medical Directory'), with an army of druggists, smaller specialists, and nurses. For the same year the Registrar-General reported the total mortality of the London 'division' at 37,151. Now, supposing that the number of cases attended privately only equalled the number for which the profession received no remuneration, there were not fewer than 35 cases of sickness to each death—a very high estimate.

reported with the general mortality, I find that while in London the death-rate is comparatively low, the public sickness-rate is apparently much higher than in any continental city from which I have been favoured with statistical returns.

Nor will the vast amount of illness prevailing in our large towns seem at all improbable to those who reflect on the social circumstances and changes to which I have alluded in the first of the following papers (p. 4) and elsewhere.[1] There are grounds for the belief that while the standard of hygienic observances, personal and public, remains at its present level, and while the average age of the population is gradually increasing, especially in towns, *a diminution in the rate of mortality will be found to co-exist generally with an augmentation of the rate of sickness.* The very triumphs of advancing medical art are probably attended by an average prolongation of the helpless and infirm conditions of life.

If it were possible to include the amount as well as the intensity of disease in a national inquiry of wider scope than that so laboriously and skilfully applied by Dr. Headlam Greenhow[2] to the mere death-rates from particular diseases in 105 registration districts,—or rather, if the death-rate from each disease, the cases being correctly certified and traced to their proper causes, could be determined for every district, town, and sanitary jurisdiction in the kingdom, as it has been determined for the whole of England and for London by the Registrar-General, on his present imperfect data, we might at no distant day rejoice in our acquaintance with the comparative effects, upon health as well as upon life, of different causes, in places of every description, under conditions and employments the most various, and at every

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[1] 'Deaths in a younger population are attended with less sickness than deaths in an older,—in a male population than in a female,—in an agricultural than in a manufacturing community.'—*Sanitary Legislation*, &c., p. 16.

[2] 'Papers on the Sanitary Condition of the People of England,' 1858.

period of the people's lifetime. Even if comparisons of local rates of mortality were always founded on such an analysis of deaths, according to age, as Dr. Farr[1] has so clearly proved to be essential, we should be spared that preposterous abuse of the published death-rates which often characterises popular statements and pleas for 'sanitary' reform. The mere proportion of deaths to population in some town or building, within a brief period, is again and again put forward as a proof of the favourable or unfavourable condition of health in that place, without reference to the ages, habits, and employments of its inhabitants, without distinguishing residents from casual immigrants,[2] regardless of vicissitudes

[1] Registrar-General, 20th 'Annual Report,' p. 174.

[2] The remarkable effect upon the death-rate of a town, produced by a large proportion of migratory residents, has been well shown in Frankfort by Dr. G. Varrentrapp, one of the most expert and accurate of statists, to whom I am indebted for some very interesting particulars.

The general death-rate of that city (average of eight years) is about 18·4 per 1,000; that of the suburban villages 25·5—a startling fact for any one who relies on local death-rates. But when the population of the city is analyzed, it appears that no less than 4-9ths consist of strangers, 'persons who come to serve or work there,' mostly in the early period of adult life, unmarried and without children. There is therefore a large 'excess of that part of the population which experiences, on account of age, less than the average rate of mortality' (Dr. Farr). Not more than 10 per cent. of the foreign residents are under 14 years of age. This reduces the proportion of children in the whole population to 19 per cent.; whereas, in the adjacent villages, the proportion is just half as much again—28½ per cent., which is about the same as in London, where 32 per cent. are under 15. (In England, 36 per cent.; in France, 27 per cent.)

It appears that in 1858, deducting still-births, which are registered among the deaths, 472 or 473 persons died under 14 years of age, the population under that age being 12,371. The death-rate of children was therefore 38·1; while the death-rate at all ages was 18·4. In London, the death-rate under 15 is about 34·8, while the average death-rate is 24·2. This comparison goes far to establish a higher infantile mortality, with a far lower average death-rate for Frankfort than for London.

Further, the apparently higher death-rate of villages round Frankfort is in great measure due to numerous illegitimate births, occurring in the houses of midwives who provide for the sins of the city. Removing this urban influence upon the suburban death-rate, and assuming the ages of

of climate and seasons, calamitous events, or any other modifying circumstances. Locality and structural reforms are extolled or condemned on evidence which would scarcely satisfy even a coroner's jury. Such a misuse of vital statistics almost justifies the opponents of the science in their trite remark that 'you may prove anything by figures.' The indiscriminate appeals so often made to the rates of mortality threaten to become a public nuisance.[1] An ill-informed member of the House of Peers lately announced that the Registrar-General's reports of a decreasing death-rate in the large towns

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the village population to be the same as those of the city, the ratio of mortality at each period of life may be actually less in the villages than in the city; thus reversing the fallacious conclusion which might be drawn simply from their respective death-rates. It must be recollected that Frankfort is remarkable for a general *bien-être* and absence of pauperism.

[1] [1874. In Dr. Letheby's able address to the Society of Medical Officers of Health, Oct. 17th, 1874, 'On the Estimation of the Sanitary Condition of Communities,' he quoted the concluding words of the above sentence in support of his bold criticism. Accordingly, I was at once exhibited in the *Times* and other journals as an abettor of Dr. Letheby's alleged heresies. On mature reconsideration, I have nothing to retract. I beg only that it may be noticed that I do not attack rates of mortality in the abstract, but only the abuse of them—the indiscriminate appeals made to them—the fallacious, unjustifiable, and unscientific manner in which these general death-rates, often for ill-defined districts and for short periods, have been misused by sanitary writers and speakers.

Dr. Farr now wisely terms them 'crude death-rates.' (Weekly Return, No. 43, 1874, pp. 357, 8.)

If these are to be employed as an eminent though unscientific sanitarian proposes to employ them, they might indeed 'become a public nuisance.' That gentleman has publicly announced that contractors for sanitary improvements and new dwellings ought to be required to contract for a certain reduction of death-rate! Should so absurd a regulation ever be enforced, it is clear that a clever, unscrupulous contractor, aided by local jobbery, might easily select and adroitly manœuvre the inhabitants of the 'reformed' districts or blocks, so that their natural mortality, according to age, sex, habits, &c., &c., might for a time bring down his death-rate within the limit named in his contract, even whilst his constructions might be of a most objectionable character. Such a misuse of statistics is no mere hypothesis; it has actually been perpetrated.]

proved that any legislation against the adulteration of food was wholly unnecessary!

The real sanitary condition[1] of a population, that is, its average state of health, is most correctly determined by summing up the periods during which persons of every age and sort suffer from disease, injury, or infirmity, so as to incapacitate them, in youth and middle age, for the ordinary business and functions of life, or to make them, in childhood and old age, subjects for constant care and nursing.

The total 'sick-time' measures the *amount* of disease. Medical records display its *nature* and *causes*. The number of deaths, according to sex and age, determines its *intensity*. Upon these stand-points every statistical inquiry respecting life and health ought to depend.

13. When the principal phenomena of disease and death shall be carefully noted and faithfully reported in every district,—when they shall be subjected to close analysis and rigid induction by scientific superintendents of registration, we may reasonably expect the establishment of some laws of causation, some principles of prevention, and some authoritative check upon the impertinent dogmatism of unlearned and superficial sanitarians.

At present, beside the difficulty of clearing problems of ætiology from the extraneous considerations with which they have been surrounded by motives of personal interest, such as official advancement, commercial profit, or political convenience, we have to encounter the more serious task of reconciling the observations of disinterested and philosophical inquirers who have, honestly enough, arrived at very different

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[1] The phrase 'sanitary condition' is now very often used to signify the extent to which cleansing of streets and houses is adopted in any place—a curious instance of recent change in the meaning of a word which I respectfully commend to the notice of Dean Trench.

conclusions. Take, for example, the views of the late Dr. Snow as to the mode by which Cholera is propagated.[1] Compare them with those in the same direction, but worked out with greater logical precision and force of illustration, by that positive contagionist, Dr. W. Budd, as regards both Cholera and Typhoid fever. Proceed with the comprehensive researches of Dr. Murchison, who concludes that while Typhus fever is eminently contagious and seldom met with in country districts except as the result of direct importation, Typhoid fever is contagious only in a limited sense, and being generated, as he believes, by emanations from putrefying organic matter, ought to be called Pythogenic fever.[2] The cesspools and sewers which on this theory are the source of the mischief, Dr. W. Budd declares to be only the means of conveying a specific poison poured forth from some diseased intestines; and he therefore names it Intestinal fever.[3] We turn from one to the other of these learned and sagacious observers with a conviction that each has given a series of illustrative facts which is all but inexplicable on the contrary hypothesis.

Dr. Herbert Barker, again, in his interesting monograph on the origin and propagation of epidemics, admits the contagiousness of typhus or typhoid (not precisely distinguishing the two) with still greater reservation. He attributes the source and diffusion of both mainly to local causes. He acknowledges, with Dr. Murchison, the 'cesspool fever;' but, with Dr. Budd, he unhesitatingly classes Asiatic cholera among 'transmissible diseases, originating in a poison which is reproducible in the body.' Few well-informed persons, indeed, now venture to deny that pestilential cholera is communicable by human intercourse.

In opposition to the pythogenic theory, appears also the

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[1] 'Cholera and the Water Supply in the South Districts of London.'

[2] See *Medico-Chirurgical Transactions*, Vol. XLI.

[3] See Dr. W. Budd's Work on Typhoid Fever. 1873.

negative evidence of a distinguished officer, Dr. M'William, C.B., who shows that a class of persons employed in the Customs (waterside officers), who are peculiarly exposed to exhalations from decaying organic matter in the foul water and festering mud banks of the Thames, are, if anything, less liable than others to fever and cholera.

One can hardly pass on without noticing the singular views of Dr. Parkin,[1] who seems to have studied the rise and progress of epidemics in almost all parts of the world. He ignores altogether the influence of contagion. He also denies, and brings a striking array of evidence in support of his denial, that either 'the products of decomposing matter on the surface, or the alteration of the air by over-crowding, or the use of impure water, have any influence in the production of the two classes of disease termed epidemic and endemic.' These he traces in many remarkable instances to telluric exhalations or the escape of malaria from the ground, the particular miasm depending on the nature of the soil and its geological peculiarities.

We are next told by Mr. Craig, of Ayr, that all the influences before mentioned—filth, impure air, contagion, miasmata—are as nought in the production of epidemics, compared with variations in electric tension! Yet this strange exaggeration of a remote cause of disease ought not to deter us from a most careful study of the morbific action of the imponderable elements, as shown especially in meteorological phenomena. Moreover, we have yet to learn how much of the causation and prevention of disease depends upon its geographical distribution.[2]

I purposely avoid a reference to older controversies, such

[1] 'The Causation and Prevention of Disease.' By John Parkin, M.D. 1859.

[2] This important question, still in its infancy, is now being well handled by a learned physician of Dantzic, Dr. Hirsch.

as those on plague and yellow fever, or the earlier discussions on cholera, in which our highest authorities of the day were engaged, important as their bearing is upon the general question. I have confined myself to a few of the latest independent writers, and I seek for a reasonable explanation of the contrariety of their evidence. The thread of truth may probably be disentangled in time by closer inquiry, by wider and more systematic observation of facts. A far keener distinction needs to be drawn between the elementary principle or essence peculiar to each zymotic disease—whatever that element may be—and the conditions under which it grows and spreads; these conditions being too often mistaken for its cause. Neither philosophy nor physical science warrants the notion that precisely the same single cause can produce directly fifty different effects. The existence of specific contagion in certain epidemics, of which small-pox may be taken as a type, is undeniable. The specific virus of small-pox is demonstrable. Progressive medical investigation may show, if it has not already shown, a material and communicable virus in other less obvious infections. A large majority of physicians of great renown, including many most careful observers and logical reasoners, have been and still are to be found in the ranks of the so-called 'contagionists,' holding the doctrine with various limitations, and not seldom differing widely as to the exact manner in which the material cause of disease is communicated.

But in justice to the minority who deny the influence, or even the existence, of personal infection, we must acknowledge that they have been among the foremost in the righteous battle with Foul Air and its sources, which they seem to regard as the sole cause of epidemic sickness and of preventable mortality.

All these doubts and conflicts may serve to teach us that moderation and humility which ought to guide our search

for truth. They ought to check that overweening confidence which detracts so sorely from the merit of some recent sanitary publications. My chief object in referring to these controversies is to adduce another proof of the necessity of more extended, impartial, and permanent investigation into the social circumstances of disease—and especially of epidemic disease—than has ever yet been attempted.

14. Is anyone so sanguine as to expect that a body of competent reporters might be organized for the whole of the United Kingdom without any legislative arrangements of a permanent nature? Or can it be reasonably supposed that the end could be obtained by leaving it wholly to local representative bodies or to merely spontaneous association? The voluntary principle, so powerful in the diffusion of Christianity, in works of mercy, in struggles for liberty, and in scientific discovery, has invariably proved quite unequal to the regular, constant, and universal performance of laborious official duties, without any hope of profit or of praise. The mere certification of the 'cause' of death, performed as it is, voluntarily though too often imperfectly, by the greater number of English practitioners, can by no means be admitted as an instance to the contrary. A gratuitous undertaking occupying scarcely five minutes for each death, though honourable to the profession, can hardly be considered a sacrifice.

Attempts to return the medico-sanitary statistics of districts by scientific associations, though highly creditable to the members, could only be, as they have proved to be, incomplete, unsystematic, and temporary. The contributors would be for the most part actuated by similar views, influenced by the same traditions, and often prompted by common professional interests. Their ablest and fullest reports would rarely represent the experience even of the body to which they belong.

Quite as little could we rely on any special commission appointed by Government. For, if in action only for a time or on emergencies, it would in no way meet the great requirements of the case. Mr. Chadwick has well shown the evils of that system. To a permanent organization of the kind there would be grave constitutional objections. In the absence of legal tests of competency and public proofs of excellence, the selection of commissioners would become a mere matter of personal preference. The standard of qualification would be arbitrary, and the commission would sink into an affair of political patronage. No one who has a just respect for science could view with indifference, still less with approbation, any such contrivance.

There remains a constitutional and rational course of procedure. Offices of high responsibility and requiring special qualifications in the holders should be created by Act of Parliament. The choice of officers ought not to depend upon privilege, prerogative, or patronage, nor yet upon the fleeting breath of popular favour; but solely upon personal fitness, fairly tested by the examiners of a University or Board of Science, unless satisfactorily proved by meritorious services, publicly acknowledged.

15. An objection of a singular nature has been made to the project advocated in these papers, to the effect that if authorities were constituted to prepare and publish reports of the sickness and mortality of every district or local sanitary jurisdiction, nothing would be left for the amateur statists of each place to accomplish. In other words, that it is expedient to tax the country for imperfect returns, admitted to be unavailable for local purposes, in order that the national spirit of spontaneous effort may be roused, and that every village may produce a Michael or a Carpenter! If this be sound policy, it is applicable as well to the business

of administration as to the supply of intelligence at the public cost. In fact, for aught we know, it may be an esoteric principle of state management, and may thus serve to explain some remarkable passages in the history of civil and military administration. For instance, had the Governments of Europe maintained humane and wholesome prisons, we might never have heard of John Howard's philanthropy. Had the sick and wounded in that unfortunate Crimean campaign been duly provided for and properly tended by appointed officials, Florence Nightingale might not have so nobly earned her world-wide fame. There may then be a deliberate and profound design in these apparent *lâches*. The production of philanthropists and social reformers may be the 'final cause,' as a logician would say, for the perpetration of blunders and the conservation of abuses.

But unhappily for this splendid theory, there is also a host of discontented tax-payers who will not accept the explanation, practical men who persist in demanding, that if central offices—a Census and Registration Department, a Council of Health, a Poor Law Board—are to be maintained, and their blue books printed at the public charge, the information these afford shall apply correctly to every town and district, and be easy of reference to its inhabitants.

16. Any attempt to defeat a fair project for the improvement of local administration by raising against it the stale cry of centralization, despotism, bureaucracy, would be intelligible enough and in some degree excusable, if made either by the local bodies themselves or by ephemeral journalists who have some clique to serve, or a profit to turn by fostering vulgar conceits. But we can hardly suppose that an objection of the kind would come from the heads of a central department with the view of averting public attention from its defects. Such an attack, however, from

any quarter, is the less to be apprehended in the case of my proposals, as their object is, unmistakably, the localization of intelligence as opposed to its mere centralization.

Instruction in the main facts of life and health, of death and disease, which are alike the foundation and the plea for sanitary laws, ought of course to precede any grant of power to administer those laws; and a machinery for collecting and diffusing the necessary knowledge ought to be the preliminary condition of any further legislation for the public health. The first demand of every rational sanitary reformer would therefore be 'that a permanent organization for local scientific inquiry and report be established in every registration district or small group of districts.'

This indispensable requirement was omitted in a very important petition from the Council of the Social Science Association, presented to Parliament in 1859. The petitioners were, doubtless, justified in praying 'that local authorities be invested with sufficient powers for dealing with causes of disease,' and 'that the Crown exercise a reasonable amount of supervision as to the efficiency and success with which these powers are employed;' but they failed to ask for the fulfilment of the primary condition which could alone make the exercise of those powers an advantage to the people. It seems to me that petitions of this kind proceed on the mistaken assumption that all causes of preventable disease can and will be removed by parochial vestries and boards elected by ratepayers, ignoring the only reliable basis upon which sanitary regulations can rest. So long as a large share of disease-causation is due to circumstances and conditions, which, though probably removable, may yet be wholly beyond the reach and irrespective of the functions of town councils and local boards, it is as unreasonable as it is untrue to call for only one class of preventive measures.

I have elsewhere exposed the common fallacy of assuming that a comparatively high general death-rate, in any town or district, is an absolute proof even of excessive mortality in its proper population. The alleged excess has to be examined. The facts have to be analysed by competent investigators, men versed in statistical researches. The deaths of recent immigrants have to be separated. The mortality has also to be checked by the sickness and infirmity not ending fatally, and by the proportion of 'effectives' among the inhabitants. This information it is no less the duty than the policy of the national Government to supply. It cannot prudently be left to the suspected localities. If courageous persons here and there have published, at their own risk, and possibly to their disadvantage, local verities unpalatable to their neighbours, others are to be found, though I hope only a few, who would not hesitate to distort the scanty evidence within their reach for the sake of propitiating Bumbledom and fattening upon a popular delusion.

17. To those only who have read the preceding papers will the concluding remarks be interesting or even intelligible; but they are rendered necessary by objections which have been raised to some details of my scheme.

A few members of the *legal* profession, it appears, have taken alarm at the proposal to appoint *medical* Superintendent Registrars of Births and Deaths, supposing that it would involve them in some loss of official employment and salary. Their patriotic anxieties are needless, I am glad to say, on the present occasion. If the suggested reforms should happily be adopted by Parliament, the office now held by lawyers and clerks of unions would remain virtually intact; only the name of their appointment would be changed. They would still be Superintendent Registrars of Marriages; and as those duties which relate to marriages, places of

worship, &c., constitute the bulk of the services imposed by successive statutes on the present superintendents, and are, in fact, all which cost them any time or trouble, it would be most unreasonable in any case to diminish the salary of the office as it now exists. The medical appointment would be distinct, embracing indeed the verification of the Registrar's accounts of births and deaths, but in no other way necessarily interfering with the responsibilities of the present office.

18. Any violent or sudden disturbance of existing arrangements might be easily avoided; and, as it is proposed to deal only with vacancies as they happen, it is highly improbable that the proposed sanitary office could be at once completely organized in any district.

By way of illustration, we may suppose that, in case of a vacancy, the power of appointing a medical successor in the birth and death department remains with the board of guardians; the qualifications, salary, and tenure of the new office being determined either by Parliament, or by some Government authorities legally empowered for the purpose. Let us suppose, also, that a vacancy occurs in a single registration district, and that a candidate is selected whose fitness has been satisfactorily tested, and who is ready to accept the small governmental salary, which, according to my estimate (p. 9) would be from 170*l.* to 200*l.* for a registration district of the average size and population. Obviously, it might be impossible in the first instance to insist upon the provision which debars the officer from private practice, for the board might have no option but to appoint one of the resident practitioners. In the event, however, of their appointing a non-resident candidate, the prohibition ought to be enforced. Other functions of sanitary police and legal medicine which, in the second paper, are proposed to be com-

mitted to the new superintendent, and to be paid for out of the county rates, might be performed at once by an officer who is not permitted to practise privately; but in no case should they be committed to a resident medical practitioner, continuing to act in this capacity.

The appointment being duly made, one of the earliest duties of the new officer would be to make careful inquiry into the grouping of population, the boundaries and natural features of his own and of neighbouring districts, so as to procure all necessary *data* preparatory to a convenient extension of his jurisdiction, by authority of the Registrar-General, on the occurrence of any vacancy in the adjacent districts to be annexed or divided; for I contemplate only 250 sanitary superintendents in the 587 provincial registration districts of England and Wales.

[1870.—It now appears that less than 150 of such officers would suffice under proper arrangements for work by deputies.]

A generation might pass away before the normal organization would be completed in every part of the kingdom; but the advantages of adopting a system to come so gradually into operation would more than compensate for a long delay of uniformity. Time would be given to perfect minor details. The medical superintendents, not being at first entrusted with districts of the full extent to be ultimately assigned to them, would be more able to encounter the difficulties of an untried employment. Experience might point out the desirableness of some modifications of the original scheme; and the vast majority of districts would gain by the gradual introduction of the reform.

IV.

AN ACCOUNT OF PUBLIC EFFORTS, IN 1859–1863, TO AMEND OUR NATIONAL RECORDS OF VITAL STATISTICS IN ENGLAND AND IRELAND, AND THEIR RESULTS.

1. The preceding papers (I. and II.) were read for the author, in his absence, by the lamented Rev. C. H. Hartshorne,[1] Rector of Holdenby, in the Health Department of the Social Science Association, and were followed by an animated discussion on the working of our registration system.

Among those who criticised it were Mr. Alfred Price, a zealous sanitarian, of Gloucester; Mr. Alfred Aspland, F.R.C.S. and J.P. of Dukinfield; and Dr. Duncan, Health Officer of Liverpool; their remarks being reported in the pamphlet before cited, 'The Right Use of Records founded on Local Facts' (pp. v–vii); while Dr. Farr's valuable reply on the whole question is reported in the 'Transactions' of the Association (vol. iii. p. 615).

The following resolutions were unanimously adopted by the Department:—

(1.) 'That the Council of this Association be requested to appoint a Special Committee to inquire into the existing arrangements for the registration of births and deaths, and the causes of death; also respecting the non-registration of sickness treated at the cost of the community. The committee to report on

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[1] The late Mr. Hartshorne, the distinguished historian of Local Parliaments and Family Muniments, had contributed a very interesting and instructive paper on 'Homes for Working Men' to the first meeting of the Association, and to its first volume of 'Transactions.' He is also famous as the originator of the movement in 1848 for improving the drainage and health of the extensive district of the Nene Valley. After great exertions for five years, he succeeded in obtaining an Act of Parliament for the improvement of the whole river—a most beneficial measure.

these matters to the Council, with such recommendations as they think fit, of new or amended regulations.

(2.) 'That it be recommended to the Council to appoint the following members of the Association as the committee, with power to add to their number such other persons conversant with the subjects referred, as they may deem advisable; three to be a quorum:—The Right Hon. W. Cowper, M.P.; Dr. Southwood Smith, Dr. Farr; John Simon, Esq.; Dr. Headlam Greenhow; Rev. C. H. Hartshorne; Alfred Aspland, Esq.; Dr. Rumsey.

At the close of the debate, the President of the Department, the Right Hon. W. Cowper, M.P., summed up in favour of the author's suggestions; and in his admirable and comprehensive address on the following day, recommended all the main features of this project; namely, adaptation of the boundaries of registration districts and sub-districts to the limits of sanitary jurisdictions—improvement in the reports of the causes of death—a registration of sicknesses not terminating fatally—medical supervision of the returns of births, deaths, and diseases in each district, unconnected with the registration of marriages.

No discussion could have ended more auspiciously for the project thus launched at Bradford.

2. At a meeting of the Council of the Association, held in London on the following November 16th, a resolution was passed embodying the recommendations of the Public Health Department at Bradford, and adding to the subjects for inquiry 'the non-registration of still-born children' and 'the extension of registration of births, deaths, and marriages to Ireland.' The following names were added to the list of the committee:—Sir James Clark, Bart., M.D.; Dr. Acland, Mr. Edwin Chadwick, C.B.; Mr. Horace Mann, Mr. Charles Hawkins, Mr. P. H. Holland.

The Council limited the committee to the statistical question, it being thought unadvisable to enter upon the subject of sanitary police.

The following resolutions were passed by the committee, after careful consideration, at three meetings in London, in March 1860:—

(1.) 'That in order to render the registration of deaths as trustworthy and useful as it ought to be for public purposes, it is, in the opinion of this committee, desirable to substitute for the present non-scientific Superintendent Registrars of Births and Deaths, as vacancies occur among them, an order of highly-qualified medical superintendents, whose scientific acquirements and practical efficiency should be duly tested by examination, or otherwise, before their appointment.

(2.) 'That it is desirable, in connection with this change, to separate the office of Superintendent Registrar of Marriages from that of Superintendent Registrar of Births and Deaths, and to leave it, where it now generally is, in the hands of the clerk of the board of guardians.

(3.) 'That it is desirable to combine with the superintendence of the registration of births and deaths that of sickness attended at the public expense, and as far as possible that of sickness attended at public institutions.

(4.) 'That it is desirable to require the authentication of the cause of death by a certificate from a legally-qualified medical practitioner, or that when no such certificate is delivered, the sub-registrar be required to inform the Medical Superintendent Registrar, or, if not appointed, a sanitary officer, who shall forthwith make inquiry into the cause of death.

(5.) 'That an annual report embodying the results of the registration of births, deaths, and sickness, be prepared and published for the instruction of the public and the local administrative bodies.

(6.) 'That the local reports referred to in the fifth resolution of this committee be prepared and published by the Superintendent Registrar of each district, in a form determined by the Registrar-General, for the information of the inhabitants and local authorities.

(7.) 'That in addition to the annual reports already mentioned, a quarterly summary of the deaths and sickness of the district shall be published by each Superintendent Registrar.

(8.) 'That the registration of each birth be enforced, and that the births of still-born children from the sixth month upwards

be registered, subject, when not certified by a legally-qualified medical practitioner, to the regulation stated in the fourth resolution of this committee.

(9.) 'That as the boundaries of registration districts very often do not coincide with the boundaries of towns or of districts under the jurisdiction of local authorities, it is desirable, wherever such places comprise portions of several registration districts, that the latter should be consolidated under one Superintendent Registrar, who shall prepare his reports in such a form as will show the vital statistics of the town or towns, or of newly-formed communities, separated from that of purely rural or suburban districts.

(10.) 'That in the local reports of mortality and sickness, it is important the returns should specify age, occupation, and class.

(11.) 'That it is desirable the registration of marriages, births, and deaths be extended to Ireland, and that the registration of births and deaths in that country be carried out in accordance with the resolutions agreed to by the committee in reference to England.

(12.) 'That the resolutions agreed to at the three meetings of this committee be reported to the Council of the Association, with a recommendation that communications be opened with the Government, the Registrar-General, and the Poor Law Board, for the purpose of laying before them the suggestions of the Association, and of conferring with them as to the best mode of embodying them in a legislative enactment.'

3. The Council took into consideration the preceding resolutions on June 7th, 1870, and, after full discussion, confirmed them, and appointed a deputation for the purpose of conferring with the Home Secretary, the Registrar-General, and the Poor Law Board.

The result of these communications, as far as England was concerned, did not appear in the published records of the Association; but the 'Transactions' of 1861 contain the following notice by Mr. G. W. Hastings:—

'Mr. Rumsey, of Cheltenham, in two elaborate papers read at Bradford, brought before the notice of the Association the defects in our system of registration of deaths, and the total want of

any plan for recording sickness, and he suggested the means for at once remedying these shortcomings, and establishing throughout the country an organization of skilled officers for the observation and prevention of disease. These papers are among the most valuable contributed to our "Transactions," and a committee to whom they were referred by the Council declared, in a series of resolutions, their adhesion to the leading points in Mr. Rumsey's views. These resolutions were subsequently brought under the notice of the Home Office, and the Council are now engaged in again urging them on the Government, as the soundest basis on which the system of registration about to be commenced in Ireland could be carried out.

'There may be difficulties in adapting the scheme of Mr. Rumsey to an old system such as we have in England; there can be nothing but advantage in framing an entirely new organization on his scientific principles.'

4. The subject was brought before the British Medical Association at its London Congress in 1862, and the following resolutions were passed:—

(1.) 'That in any measure of legislation for the registration of births and deaths in Ireland, this Association deems it highly important that the local machinery for such registration should be altogether distinct from that for the registration of marriages; and is happy to perceive that this principle has been recognised in the Bills which have been introduced into the House of Commons during this and the preceding sessions of Parliament.

(2.) 'That it is most desirable to introduce into any such measure the principle of local scientific supervision of the returns of births and deaths.

(3.) 'That the office of Superintendent Registrar of Births and Deaths ought to be held by persons well acquainted with the physical and biological sciences, versed in sanitary and vital statistics, and accustomed to make medico-legal investigations.

(4.) 'That it is desirable to combine with the superintendence of the registration of births and deaths the registration of all sickness attended in public institutions or at the public expense.

(5.) 'That each Superintendent Registrar should be required to publish, for the information of the local administrative authorities and the instruction of the inhabitants of his district,

an annual report of the results of registration, as also a quarterly summary of the deaths and diseases, with their causes, according to forms to be determined by the Registrar-General for Ireland.

(6.) 'That in the local reports of mortality and sickness it is important to specify age and occupation, to record meteorological observations, and to note local events and circumstances affecting the public health.

(7.) 'That it is desirable to require the authentication of the cause or mode of death by a certificate from a legally-qualified medical practitioner; and that, where no such certificate is delivered, the sub-registrar be required to inform the superintendent, who should forthwith make inquiry into the case.

(8.) 'That the registration of birth should be compulsory; and that still-births (after the sixth month of utero-gestation), when not certified by a legally-qualified medical practitioner, should be subject to the regulation stated in the last resolution.

(9.) 'That the boundaries of registration districts and sub-districts ought, as nearly as possible, to conform to the limits of existing districts for the relief of the poor, and for the administration of medical aid (union and dispensary districts), having due regard to the jurisdictions of local sanitary authorities.

(10.) 'That the proposed scientific superintendents, as statistical inquirers and reporters for national purposes, should be made independent of local and party influences, debarred from private medical practice, and paid out of national funds.

(11.) 'That the Council of this Association be requested to open communications with the Government, and with the Poor Law Commission of Ireland, for the purpose of laying before them the suggestions of the Association, and of conferring with them as to the best mode of embodying them in a legislative enactment.

5. An article in the 'British and Foreign Medico-Chirurgical Review,' for October, 1862, from which the following observations are taken, may serve to show the progress of the movement as regards Ireland:—

'The immediate point at issue is the nature of the forthcoming measure for the registration of births and deaths in Ireland. Legislation of some sort is inevitable. Bills have been introduced and withdrawn or dropped for the last three sessions. The

two associations already mentioned concur in an effort to apply the main principles of Mr. Rumsey's plan to Ireland; and Dr. Harkin, of Belfast, has come forward most opportunely with an able pamphlet in support of a scientific machinery for registration.[1] He puts the case thus forcibly: —

'"All experience points to a division of offices into Sub-registrar, Superintendent Registrar, and Registrar-General. The duties of the Sub-registrar bring him often face to face with death; he is to receive and forward to the Superintendent Registrar a statement of the cause thereof; he should be able, from medical and scientific knowledge, to test the value of the cause assigned, to recognise the effects produced on the human frame by mortal disease, and to understand the nature of cadaveric change. It is, however, upon his superior officer, the Superintendent Registrar, that the more important duties would devolve. His office should be to receive, to verify, to tabulate in a scientific manner the returns transmitted; to act as a check upon careless Sub-registrars; to investigate the causes of death when none are assigned; to be capable, from medical knowledge, of advising non-medical coroners, when post-mortem examinations are necessary for the discovery of truth; and when making up his quarterly returns to the Registrar-General, to give them such form and shape as shall afford information as to the vital statistics of his district, accessible to all within it. In the higher office of Registrar-General, the Government has always recognised the necessity of medical supervision, by attaching to the office, both in this country and in England, most accomplished and able medical statisticians."

'While asserting the importance of medical knowledge in each of these offices, Dr. Harkin very properly admits its supreme necessity in that of Superintendent Registrar. It is to this point that the English reformers particularly address themselves. They consider it the keystone of a normal sanitary organization.

'None but a medically-educated officer would be competent to revise the returns of Sub-registrar, to verify, digest, and tabulate the facts recorded, to transmit the returns in a serviceable form to the Registrar-General, to compile the statistical reports from

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[1] 'On the Registration of Births, Deaths, and Diseases,' read before the National Association at Dublin, with Notes and Addenda, by Alexander Harkin, M.D., Belfast, 1862.

the various dispensaries and hospitals of his district, and to prepare all these and other cognate observations for publication in the locality as a means of instruction to the people and of guidance to those who are empowered to carry into effect sanitary regulations.

'Whatever might be the public advantages of a liberal education and special acquirements for every grade of registration officers, it would be no easy matter to induce Parliament to make so high a standard of qualification obligatory upon all. If scientific attainments and statistical experience are by law to be required of one grade only, it ought certainly to be secured for the higher local appointment. If the choice of Sub-registrars by the local boards or the county magistrates can be limited by certain general instructions as to competency, &c., and by subjecting each appointment to the approval of the Registrar-General, it is perhaps as much as we can reasonably expect.

'It is the Superintendent who (if a thoroughly competent person) will be the referee in medico-legal difficulties, who will be required to utilize the returns in the cause of sanitary improvement, and who would in time be the real health officer of the district. The advocates of this measure will have to define more clearly what they mean by a scientific qualification, and how it may be supplied.

'Something must be said about the various projects of registration in Ireland recently laid before the House of Commons. In 1861 there were the rival schemes of Mr. Cardwell and Lord Naas. Their respective merits and demerits are well sifted in the Report of the Select Committee on Irish Registration in that session. This contains some amusing counter-evidence, and is not of alarming length. Mr. Cardwell would give a statutory preference to dispensary medical officers in the appointment of Sub-registrar, a proposal which Dr. Harkin has defended, and which seems to be acceptable to the majority of those surgeons.

'Are we to suppose that the small pittance to be paid to a Sub-registrar would be a desirable addition to their inadequate salaries?—that their duties as registrars would not lead them into unpleasant collision with their brethren in private practice?—that their time would not be too fully occupied with higher professional work for due attention to the pen-and-ink details of an inferior office? Possibly; but they would hardly consent to

serve under the agents and attorneys, who as union clerks would be, according to Mr. Cardwell's Bill, the Superintendent Registrars. If the Poor Law machinery should be selected, the great influence with boards of guardians and dispensary committees, which the medical officers have so deservedly acquired, may be left to work its natural result without legislative interference.

'How far better than either that of Mr. Cardwell or that of Sir Robert Peel, who had lately taken up Lord Naas's Bill, would be the project of the Social Science and Medical Associations, worked by educated and intelligent men. Its scientific results and the accuracy of its statistical details could hardly fail to reflect high credit on the Irish code. Like the excellent dispensary system of that country, it would become a model for Europe, and would re-act beneficially upon English defects and shortcomings.

'The field in Ireland is still clear for the establishment of a system correct in principle, suited to the people, and approved by competent judges. If the opportunity be neglected, and the imperfect English arrangements forced upon Ireland, we shall have thrown away our dearly-bought experience, and virtually retrograded in sanitary legislation. The question is not one of place and salary, but of science and public health.'

6. The same Review, in its number for April, 1863, contains the succeeding article, also by the author, describing the final issue of this movement.

REGISTRATION OF BIRTHS AND DEATHS IN IRELAND.

'The Bill of the Chief Secretary, Sir Robert Peel, has now passed both Houses of Parliament. Its general features are the same as those of the English Act, and, like that, it is based upon the Poor Law machinery. The registration of marriages is not included. Parents or others must give notice of births, so that the registration of births will be in some measure compulsory. Certificates of the "cause" of death must also be given by the medical attendants of those who die. This is not left, as in England, to the good-will and public spirit of the medical profession, but is to be enforced by the Act. True, no penalty for disobedience is mentioned, but a refusal to "fill up and return" the certificate will be a misdemeanour, and as such punishable by law. Knowing this, the Chief Secretary must laugh in his sleeve

when he graciously accepts the thanks of the Irish doctors for kindly omitting the forty shillings penalty inflicted upon their Scottish brethren for non-certification. Of course, there is to be no payment for the certificate. The notion of remunerating medical men for important services rendered to the public is far too Quixotic for our matter-of-fact legislators. "When gentlemen are anxious to work for nothing, why pay them?"

'In October last we reported the resolutions of the British Medical Association, with a short account of previous proceedings in the Social Science Association. The subject has since been vigorously pursued by the latter body, as appears from the following extracts from its "Minutes of Council," &c. :—

'*Nov. 20th*, 1862.—In pursuance of notice, Mr. Hastings called attention to the following resolutions of Council, passed on the 7th of December, 1861 :—That a deputation be appointed to confer with the Irish Government, in promotion of an Act for the registration of births and deaths in Ireland; and especially to press upon the Irish Government the expediency of proceeding in this matter on the principles adopted by the Council in their resolution of June 7th, 1860. That the deputation also confer on the same subject with other members of the Legislature.

'Mr. Hastings read communications received from the president of the Royal College of Surgeons in Ireland, and the secretary of the British Medical Association, offering the co-operation of those bodies in the matter; and it was resolved—

'"That the deputation be requested to act forthwith on the subject, to add to their number such members of the Association as may enable them to communicate directly with the Irish Government in Dublin, and to accept the offer of co-operation from the British Medical Association.

'"That in the event of the Irish Government declining to accede to the representations of the deputation, the executive committee be authorized to prepare a Bill embodying the principles approved by the Association, with a view to its introduction into Parliament."'

'The deputation met in London on Nov. 29th, 1862, and resolved—

'"That the following instructions be sent to the Irish members of the deputation.

'"That the Irish members of the deputation be requested to

place themselves in communication with the Irish Government for the purpose of ascertaining whether it is proposed to introduce a Bill for the registration of births and deaths in Ireland during the next session of Parliament, and to urge upon the Government the great importance of framing a Bill upon the scheme suggested by this Association, and comprised in the following heads:—

'1. That there should be local scientific supervision of the registration of births and deaths.

'2. That the office of Superintendent Registrar of Births and Deaths be held by persons well acquainted with the physical and biological sciences, versed in sanitary and vital statistics, and qualified to make medico-legal investigations.

'3. That all sickness attended in public institutions, or at the public expense, should be reported to and registered by the Superintendent Registrar.

'4. That the cause or manner of death be in every instance authenticated by a certificate from a duly-qualified medical practitioner; and that when such certificate is not delivered to the Sub-registrar at the time of registering the death, he shall report the circumstances to the Superintendent Registrar, who shall forthwith make inquiry into the case.

'5. That the registration of births be compulsory, and that still-births after the sixth month of pregnancy, when not certified by a legally-qualified medical practitioner, should be subject to the regulation stated in the last clause.

'6. That the Superintendent Registrar should be paid by stipend out of funds provided by Parliament, and be debarred from private medical practice."

'The Dublin committee of this deputation, consisting of Lord Talbot de Malahide; Right Hon. Joseph Napier; Neilson Handcock, LL.D.; Dr. Mackesy; Dr. Macdonnell; Dr. Lyons, and Dr. Harkin, had an interview on the 15th of January last with the Chief Secretary, "who heard their representations with great courtesy, and promised to pay them every attention. Sir Robert Peel has since introduced a Bill on the subject, which to some extent carries out the views urged on him by the deputation. In other respects the measure falls short of what is desired, especially in employing the clerks of unions as Superintendent Registrars, instead of the scientific superintendents recommended by the deputation. The deputation, however, consider that their func-

tions, unless further instructions be given by the Council, are now at an end; and that it must rest with that body to decide whether it is expedient to support the measure or oppose it, or to take no further action on the subject."

'The Report, from which the above is a quotation, was presented to the Council on February 19th; and it being considered unadvisable to move further in the matter at present, the Council merely resolved: "That the Report now read be received and entered on the minutes."

'Although the Chief Secretary's measure is an improvement upon his Bill of last year, it manifestly ignores the "instructions" sent by the English portion of the deputation to their Irish colleagues. Not one of the heads of the scheme drawn up in London has been adopted by Government. There is to be no "local scientific supervision" of the returns of births and deaths. The Superintendent Registrars are not to be men of science, competent to revise the medical certificates, to inquire into doubtful cases, and to promote a correct nomenclature of diseases. No provision is made for the certificated registration of still-births. Certain important duties of a medico-legal nature, which might have been committed to skilled superintendents, in suspicious and non-certified cases, are to be left unperformed. The publication in each district of correct tables of its sickness and mortality, with their causes, has been negatived.

'Yet the omission of marriage registration afforded an excellent opportunity for adopting a really scientific system. There were no established arrangements, as in England, to obstruct a reform, no lawyers to compensate for loss of business. Why, then, was not a creditable measure introduced?

'We observe that the following resolution was passed by the Irish Medical Association in December last: "That this meeting gives its full concurrence to the principles embodied in the resolutions adopted by the Council of the National Association for the Promotion of Social Science, respecting the registration of births, deaths, and sickness in Ireland." It is nevertheless highly probable that the physicians and surgeons of Ireland did not generally and cordially support those "principles," if they did not formally oppose them. The fact is, that the Poor Law medical officers (dispensary and workhouse surgeons) wanted to secure the registrarships under the Bill; and the Poor Law Union clerks

coveted the superintendent registrarships; and the resolute pressure of these two official bodies, acting in one direction, was too strong to be resisted by a weak Government. A job seems to be inevitable in any legislation for Ireland. The registration of vital statistics will now form a department of the Poor Law in all but its central office. Let us hope that the Poor Law guardians will not make the acquisition of the registrarships a plea for keeping down the salaries of their hard-worked medical officers.

'A provision for the payment of a small fee for every medical certificate, properly filled up, of the proximate cause or manner of death—adding, if possible, the causes or antecedents of the fatal illness—would have been a greater boon to the whole profession than the registration-shillings to be appropriated by the dispensary-surgeons only; and, what is of greater moment, it would have immensely increased the scientific value of the mortuary returns. The local boards might then have been left at liberty to appoint an orderly class of persons, like the majority of English registrars, *e.g.*, schoolmasters; and the measure would have been perfected by scientific officers for local supervision.

'The Report of the Social Science deputation does not tell us what were the precise propositions actually submitted to Sir Robert Peel, and how they were supported by the Dublin committee. We are quite sure that Dr. Mackesy, the worthy president of the College of Surgeons, and Dr. Harkin, of Belfast, adhered firmly to the principles which they have so ably and consistently defended. But it is rumoured that other members of the deputation threw overboard the proposed registration of sickness and the medico-legal functions of the Superintendent Registrar. The official reasons for omitting "sickness" are said to have been that the returns of the dispensary and workhouse surgeons are collected, tabulated, and arranged by the central office, and that statistics of disease are included in the decennial census! A continuous, regular, and systematic *local* investigation into the circumstances and causes of sickness and mortality by a scientific machinery, with prompt utilization of the leading facts in every district, for the public safety and in aid of sanitary improvements, seems to have been too grand a scheme for official comprehension. We, in England, know by experience the great need of *localizing* statistical inquiry and sanitary information. In Ireland they appear determined only to *centralize* it.

'The opposition of the clerks of unions to the plan of the Association is quite intelligible. An able and temperate statement of their case has been published by two of their body; but it does not touch the main points at issue. No one doubts that they are quite as competent as scientific persons to perform all the duties of a so-called Superintendent Registrar, as defined by Sir R. Peel's Bill, in conformity with the English system; and they modestly disclaim all intention to "superintend" the doctors, professing to be mere collectors and index-makers of the register books. But their admitted clerkly ability in no way affects the proposal of the reformers—that an entirely new character should be given to the office, and that functions of a supervisory, preventive, and medico-legal character should be connected with it. The argument of the clerks in behalf of an extensive field of observation in vital statistics by no means weakens the force of the scientific claim for local revision of the materials from which conclusions are to be drawn, and for the right use of facts on the spot where they happen. The eminent statisticians who have urged the want of some skilled agency to ensure accuracy and completeness in the record of facts and medical statements—without which all generalisations of the kind must be utter fallacies—are quite as fully aware as the attorneys of Cork and Waterford can be of the importance of "a large and wide induction" of particulars, with uniformity in their classification. To assert that all necessary corrections of the district returns can be effected in a metropolitan office is simply absurd. It reminds us of the late Sir James Graham's suggestion, that the duties of a bishop might be performed well enough through the post office. The case needs no further arguing. When a conclusion is foregone it is useless to reason. For the present, red tape is triumphant. If the public health movement now commencing in Ireland should spread as it has done here, the defects of the registration machinery will become as apparent there as they have long been to us. It now only remains for the scientific bodies, if they are in earnest, to seek to introduce gradually into the English system those reforms which have been for three years proposed by the Social Science Association, and sanctioned by the most competent judges.'

PART II.

ESSAYS ON THE FALLACIES OF VITAL AND SANITARY STATISTICS.

Revised and reprinted chiefly from the Social Science Review, Vols. IV. and V. 1865–6, *and from the Transactions of the Manchester Statistical Society,* 1866 *and* 1871.

Chapter the First.

§ I.—*Introductory.*

Some papers read at the Bath Meeting (1864) of the British Association, in the section of Economic Science and Statistics, under the able presidency of Dr. Farr,—especially those on the Vital Statistics of Bath, Clifton, and Cheltenham,—seem to have established the truth of criticisms, repeatedly put forth by statists and sanitary writers, on the misuse of those numerical results which are attained by the existing machinery for the registration of births and deaths.

It is clear that henceforth the general rates of mortality in 'registration districts' can no longer be quoted as tests of the health and vitality of the inhabitants of towns and parishes which, though included in the districts, are not territorially co-extensive with them. It is obvious that the average mortality on a wide tract of inhabited country cannot be fairly attributed to any one of its component portions. It was conclusively shown at Bath, as it has often been shown before by remarkable periodical variations

in local death-rates, that no single return, even though it be for a whole year, can be taken for more than an event of that year. Thus, it would be no less unreasonable and unfair—*in re* extent of area—to estimate the mortality of all the metropolitan districts by that of St. George's-in-the-East, than—*in re* duration of time—to pronounce the death-rate of any place from the return of a single quarter of a year. Yet both of these fallacies were conspicuous in that curious notice of English watering-places, which appeared in the Quarterly Return of the Registrar-General for June, 1864. We now find that the Registration districts which furnish the returns, and in particular those which are distinguished by the names of the great watering-places of the West, do not mean the included towns or cities; but that, on the contrary, they mean areas and populations differing widely in extent and in character from those of the towns proper, so that conclusions—whether true or false in themselves—drawn from the reported state of those districts, are wholly inapplicable to the condition of the towns the names of which they bear. Who, then, can wonder when some statistical expert, able to speak with authority in and for each town, comes forward, perhaps with but scant ceremony, to disparage both the figures and the inferences of the official return?

Now for examples. In the district called 'Bath,' the average rate of mortality for the decennium 1851-60 stands at 22 per 1,000 in the Registrar's Reports; but during the one unfavourable quarter ending June, 1864, the people were dying at the rate of 25 per 1,000 *per annum*, which accordingly was published, most strangely, as the death-rate of old Bath, the watering-place! But the error of a computation, based upon too limited a period of observation, was, in this instance, as it happened, almost compensated by the other error of adopting too wide an area of obser-

vation. For, according to Mr. Gore's skilful analysis, it appears that for the whole year the deaths in the urban sub-districts were at the rate of 25·7 per 1,000, while in the rural sub-districts they were barely 21 per 1,000, the aggregate average being 24·6. Now, as regards the healthiness of the city or the longevity of its inhabitants, what can be the practical value of a return, whether quarterly or annual, which merely gives the aggregate death-rate of these two most dissimilar portions of an extensive registration district which really is *not* Bath ?

Again, it seems that the district called 'Clifton' happened in an exceptional quarter to return a number of deaths which, when multiplied by 4, made up an *estimate* of 24 in each thousand of its inhabitants, or 3 in excess of its average for many years; while the district called 'Cheltenham,' for the same quarter, varied from its average rate of mortality in the opposite direction, so as to show a number of deaths, which, multiplied by 4, made only 17 per 1,000, or 2 below its ordinary rate. But when these figures, 24 and 17, were exhibited to the civilized world in the columns of the *Times* as the comparative health-rates of the towns in question, surely it was time that some competent person in each place should expose the fallacy, and declare the real annual mortality of the district, as well as of the town, according to sex and age, corrected by the classes and movements of its population. For the actual liability to death in any town to which wanderers from every region of the globe resort for health and recreation, is a matter of universal concern, rather than of mere local interest.

Accordingly, Dr. Symonds, of Clifton, of whom it may well be said, '*nihil tetigit quod non ornavit*,' though the subject were dry as a statistical controversy, showed with his accustomed force and elegance of style that Clifton proper, the sub-district, can boast of an annual death-rate of only

17 per 1,000;[1] while Dr. Wilson, in an admirable Essay on Cheltenham,[2] proved with the sternness of Roman justice that the town proper, the sub-district, cannot yet claim a lower average death-rate than 19 per 1,000, and that its mortality is somewhat above that of the wide agricultural district on which it stands. The curious effects upon the death-rates of these districts, produced by an enormous excess of females in their populations, by the inclusion of public institutions, and by their peculiar formation, may be noticed hereafter. It was the happy lot of the defenders of these healthy and attractive towns to concur in demonstrating that the mortality of each was, on the whole, decreasing.[3]

The preceding instances of a recent misuse of figures, for the purpose of exhibiting comparative salubrities in rival watering-places, may serve to open a discussion upon a very large and complicated question.

§ II.—*The want of Records of Disease.*

(1.) We wish to know—not merely whether a certain percentage correctly represents the average of ratios of deaths to population in certain towns or districts—ratios which may have fluctuated between very distant extremes in a series of years,—but also whether any such average ratio, when fairly calculated, indicates truly the liabilities to death and disease which each inhabitant incurs. We wish to know, in a word, how much 'general death-rates' have really to do with local unhealthiness. It is almost needless to say that, in these calculations, the uncertain but gigantic element of

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[1] 'The Health of Clifton,' p. 360. Miscellanies, by John Addington Symonds, M.D. Edited by his Son. London. Macmillan. 1871.

[2] 'Sanitary Statistics of Cheltenham.' Longman. 1865.

[3]

			Death-rate.
Clifton, Proper.....	According to	R. G., 1851-60.....	17·49
	,,	Dr. Symonds, 1859-63	17
Cheltenham, Proper...	,,	R. G., 1851-60.....	19·57
	,,	Dr. Wilson, 1853-62	19·29

sickness, not ending fatally, is wholly excluded. The bare statistics of mortality ignore all that precedes the close of life.

To say nothing of war and earthquakes, which happily do not now figure among the causes of death in Somerset House returns, there are, on the one hand, those sudden additions to the death-roll which are caused by great catastrophes, such as a shipwreck, a railway crash, an inundation, a mine explosion, or even a rapid change of temperature; and, on the other hand, there are the vastly larger if not more appalling augmentations caused by the daily struggle for life among the crowded poor of great cities. Yet these two sorts of events tell alike, in proportion to the numbers killed, upon a general death-rate. But, how striking the contrast of the antecedents to death in the two cases! The sudden extinction of vigorous effort in the one class of sufferers,—the long helplessness and lingering exhaustion in the other! These are extreme instances. But, though not presenting so complete a contrast, various kinds of ailment and accident, respectively prevailing in different groups of population, denote marked differences in the duration and intensity of suffering not a whit less momentous in their social consequences; yet the death-rate is silent about them. Where are the records of that huge mass of common sickness which is not 'unto death'? What do we know, for certain, even of that million or two of attacks occurring among the poor, for the relief of which every rate-payer is taxed, although the burden may be mainly borne by the medical profession? What of the vast amount of disease and casualty treated at the hospitals and dispensaries of this country? How much of it is due to the place from whence each patient comes? How much of all disease depends on sex, on age, on industrial occupation, on habits, on dwellings, on food and drink, on destitution, ignorance, neglect, and infant mismanagement,—how much on physical or atmospheric

changes affecting animal and vegetable life generally,—how much on race, family, and inheritance,—and how much on contagion,—all to be considered apart from locality.

These questions must be answered, as nearly as may be, by a skilful analysis of authentic returns from the various institutions and officers concerned in the medical relief of the working and destitute classes, the return of every illness and injury being correctly certified, and the cases traced, where possible, to their proper origins. All this must be done, thoroughly and honestly, before any one can claim authority to decide on the comparative salubrity of towns and districts of England.

(2.) The principal members of the Epidemiological Society, in a memorial addressed not long ago to the President of the Poor Law Board, represented truly enough that 'the statistics of disease are not less necessary than the statistics of mortality.' It has been estimated, they say, that taking one disease with another, there are between 20 and 30 cases of sickness to every death; but this estimate is probably too favourable to disease, at least in large towns,[1] and they admit that there are no reliable data from which to deduce a law of sickness in relation to mortality for the labouring population. They also confess their inability to determine—except as to insanity and idiocy—the comparative frequency of chronic ailments and incurable infirmities occurring among the poor at different periods of life, and creating permanent chargeability on the parochial rates. The metropolitan officers of health, in one of their weekly returns of disease, in 1858, state from their own experience that 'the sickness table offers frequently a better test of the condition of the people, in reference to their helplessness, than even a table of deaths.' Dr. Dickson, R.N., in his reply to the questions lately sub-

[1] In Manchester the proportion varies from 28 to 30 cases to one death.

mitted by Dr. Farr to the Epidemiological Society, concerning the classification of diseases, observes :—

'Were the proposition adopted that has been recently mooted, viz., to procure official returns of all cases of sickness treated by the parochial medical officers, and by those of other charities throughout the kingdom, and by the medical officers of the public services, so great an accession to our knowledge would accrue that it could not fail to be attended with important results. For it is the amount and duration of sickness, rather than the mortality, that tell on the prosperity of a community; and the sanitary condition of a State cannot be adequately predicated from a simple enumeration of deaths.'

But there is an opinion of greater weight with the reading million than the verdict of many learned doctors. Charles Dickens, or some one writing for him, said :—

'So far as the care of the body goes, it concerns a man more to know his risks of the fifty illnesses that may throw him on his back than the possible date of the one death that must come, and of which the time is to him personally, in spite of libraries full of statistics, utterly unknown and uncertain. We join therefore in the demand for a registration of sickness that has not a fatal end, as well as for a more effective registration of births and of the causes of deaths themselves. Let us have a list of the killed and of the wounded too.'[1]

(3.) There are other advantages in frequent returns of sickness from small districts. They would 'show the influence of the varying conditions of climate and season, of prosperity or distress of the trades and manufactures, or of any other circumstances peculiar to the district.'[2] They would direct the early attention of local authorities to the precise spot where each epidemic breaks out, and would measure its progress. They would be most valuable to the

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[1] All the Year Round, vol. iv. p. 227-8.

[2] Arthur Ransome 'On the Need of Combined Medical Observation,' &c., p. 6.

inhabitants, giving them exact and timely intelligence of the presence of the disease, and enabling them promptly to deal with it. This useful signal of danger is now put forth only in a few metropolitan and northern districts, and in these it tells only partially or irregularly.

But it is needless to dwell on the social disadvantages and losses, the administrative blunders, and the scientific vagaries which depend on the absence of any authorized statistics of disease. Nor is this the occasion for discussing at length the 'ways and means' of establishing an official record of all the maladies and injuries medically treated in the various departments of public charity, associated benevolence, and mutual help. These matters will follow.

(4.) It has been shown elsewhere that very great facilities exist for collecting, at a very small cost, priceless materials here lying unemployed, there prodigally scattered and wasted. If, in this matter, our Government would veer ever so little from the orthodox tack of *laissez-faire*, affording gentle aid to those who might collect facts, putting mild pressure upon those who might supply them, and sanctioning moderate payment for work properly done, we might soon have the benefit of a public registration of sickness,—that is to say, of all cases attended under the Poor Law, as well as of those relieved in hospitals and dispensaries, and by provident societies, at least in all such institutions as enjoy immunities from the State, or are in any way protected by the law.

(5.) On several occasions since 1842, I have urged that a public registration of disease should be extended to Friendly Societies and sick clubs. Returns from these institutions are of especial value in demonstrating the effects of occupation of various kinds, as well as the influence of frugal habits, upon life and health. They supply just those elements which are necessary to compensate for the inevitable defects of Poor Law and medical-charity returns. The combination of

the three lists in every district would almost perfect a system of registration. From the returns made to the Registrar of Friendly Societies, it may be safely affirmed that more than a million of cases happen yearly among the members of the 22,000 enrolled and certified societies in England and Wales; and that involves an average of two weeks of sickness to each member. As yet very little is known of the nature and causes of the sickness relieved by the funds of these societies. Excepting the calculations which have been published by several eminent actuaries (Finlayson, Neison, Ratcliffe, and others) from the quinquennial returns, no scientific use has hitherto been made of this immense store of facts; nor indeed would it be available to the sanitary statist, unless returns were made quarterly and annually, in and for each district, giving the same particulars of cases as we propose to obtain from medical charities and the Poor Law service. Such a mass of information, when properly digested, would prove of the highest utility to the members themselves, not only as regards the financial security of their rules and tables, but as developing the circumstances and causes of the sickness which they subscribe to relieve, thus marking the connection between certain diseases and certain industries, and ensuring the vigilant attention of the largest class of the community to measures of prevention. No doubt, sickness in the Friendly Society sense is not always sickness in the medical sense; but the discrepancy, being capable of explanation by more full and scientific reports, need not affect the statistical value of corrected observations. The vast extent of this field of observation would justify any legitimate effort to cultivate it, as part of a national system of sanitary statistics. It is probable that Mr. Gladstone's admirable provision for mutual assurance among the industrious poor may be extended to sickness, greatly facilitating the registration of disease.

§ III.—*The Metropolitan Attempt to register Sickness.*

(1.) The first[1] combined effort to supply the acknowledged defect of authentic information concerning sickness of all kinds, attended at the public expense, was made spontaneously by the Metropolitan Association of Health Officers. The history of this undertaking has so important a bearing on the question of sanitary organization that it will be no loss of time or labour to inquire how it began, progressed, and ended. It is now about eight years since that useful body of energetic men resolved that returns of all *new* cases, coming under treatment at the numerous institutions of London and its suburbs, should be collected by the 50 health officers then appointed to the 37 districts under the Metropolis Local Management Act, and to the city of London. The returns were to be contributed voluntarily by medical officers in charge of the several workhouses, districts, hospitals, dispensaries, and other similar establishments. The project was encouraged by the General Board of Health, which under-

[1] In describing this attempt as the first, I had in my mind the only two great efforts made by local medical associations to register continuously all the sickness treated under the Poor Law, and in charitable institutions, within a defined district of known population. Had my scope been wider, I should not have omitted to notice an effort at registration of disease which originated with Dr. Cormack, Mr. Henry Ancell, Dr. Barker of Bedford, and Dr. Richardson, in 1852, and was brought into actual practice in the British Medical Journal of 1853. *This effort, however, did not apply to all sickness attended at the public expense in given populations.* In that case, I should also have referred to the publications of the Epidemiological Society, and especially to Dr. Richardson's spirited undertaking in 1854-8, *the object of which was simply to record epidemic visitations.*

I take this opportunity of recommending a careful perusal of Dr. Richardson's valuable paper, entitled 'Facts and Suggestions on the Registration of Disease,' read at Dublin in 1861, and published in the Transactions of the Social Science Association for that year, p. 535.

Several proposals to register sickness, anterior to the efforts mentioned by Dr. Richardson, are recorded in 'Essays in State Medicine,' pp. 106, 107, 149, and in the preceding paper, 'A Defence,' &c., p. 35.

took to print and circulate the weekly and quarterly tables. Commencing in April 1857, the periodical was ably conducted by one of the official staff, Dr. Conway Evans. Meteorological observations, taken at five stations surrounding London (beside that at Whitehall in the second year) were appended to each publication. For a time, the commendable effort gave fair promise of success. It grew and prospered. From about 4,000 cases returned in the first week, the numbers increased, though irregularly, until, in the week ending August 15, no fewer than 15,273 were announced. This was the maximum. The contributors during the first year numbered 117, beside the officers of health. In the second year the weekly number of cases averaged 10,400 from a population of about 2,000,000, and the number of contributors rose to upwards of 200, constituting, according to their last quarterly publication, 'one of the most creditable organizations of any profession.' But, from first to last, the co-operating districts and institutions formed only a minority of those within the metropolitan boundary. Of the 109 hospitals and dispensaries, general and special, rarely more and generally less than 50 contributed, although nearly all the *general* hospitals made returns. Then it must be noticed that the diseases and accidents reported were not all new cases; for, as is well known, the same patient often applies to several charities in succession, and is entered at each as a new case. Many patients 'wander about from hospital to hospital, as fickle in the choice of a physician as those whose ailments are purely imaginary.'—*Weekly Return*, No. 3. There being no organized co-operation among the multifarious sources of aid, it is next to impossible to trace the wanderer and to follow up the history of his case from charity to charity. Then a considerable proportion is sent up from the country districts, and does not represent the unhealthiness of the metropolis. The methods

of registration in a large proportion of the institutions are far from satisfactory. In some the temptation seems almost irresistible to represent the number of patients greater than it really is. From others the reply was, 'no records kept,' or, 'diseases not specified.' But apart from these constant sources of fallacy, the returns made to the Association were very irregular and intermittent. Some were sent in only on every second or third week. Others were omitted altogether for long periods. From six or seven entire districts of metropolitan management no returns seem to have been received at any time. Then, as to workhouses and Poor Law districts, out of the 180 appointments under this department within the metropolitan boundary, only 43 of the medical officers were to be found among contributors to the weekly return during the first year, and barely 80 in the second.

(2.) In several instances the information was refused by the board of guardians, and throughout there was no authorized method of communication between the officers of health and the officers appointed to the care of the sick poor. Reckoning all the out-door patients treated in each health officer's district as if comprised in one return, and each reporting workhouse and medical charity singly, as to in-patients, it appears that in the first quarter of 1858, when this system was beginning to work more evenly, out of 147 contributing districts and institutions only 87 sent returns for all the thirteen weeks; the others only for seven or eight weeks on the average. In the second quarter, out of 145 only 96 districts and institutions contributed regularly, the remaining 49 for only eight weeks on the average. In the third quarter, out of 144 professed contributors, only 77 were constant, and the remaining 67 averaged nine weeks each.

(3.) Whilst the records were so imperfect and the returns

so irregular, it need hardly be said that, as a guide to the rise and decline of disease in the metropolis, the publication was almost worthless.[1] Reliable comparisons were possible only in the few districts from which the returns were always full and punctual, as in that of the late lamented president of that Association, Dr. R. D. Thompson, who continued to collect and publish his weekly reports of sickness to the end of his useful life. Some time before the second year had expired in November, 1858, this well-meant but ill-fated publication suddenly ceased, without notice or explanation. One is tempted to ask how this came to pass. Was it that the transfer of medico-sanitary functions from the late General Board of Health to the Privy Council interfered with the official issue of these papers? Was it that the inconsiderable expense of printing them frightened the Government into one of those intermittent paroxysms of economy, the violence of which is generally spent upon the cultivators of science and the promoters of education? Was it that the members of the Association themselves perceived that the incompleteness of their work and the flagging zeal of their contributors precluded all hope of ultimate success? Whatever might be the reason or the pretext, the failure of their attempt was evidently due to a defective organization.

There being no legal sanction, no direct responsibility, voluntary co-operation proved unequal to the enterprise. The resident officers of charities were under no obligation to be punctual and precise; and the parochial authorities rather

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[1] 'It is, however, much to be regretted that the returns already contributed have been in many instances so irregularly supplied as to render anything like statistical comparisons altogether impossible. Any attempt, therefore, to draw conclusions as to the circumstances under which diseases originate or spread, or even to institute comparisons between districts and institutions from week to week, is obviously out of the question.'—*Dr. Conway Evans' Metropolitan Weekly Return*, No. 36.

resented interference than aided the effort. If, notwithstanding the resources of the metropolis, official countenance, and the great ability and earnestness of its promoters, this undertaking failed, what could be expected of any similar attempt elsewhere?

§ IV.—*The Manchester more successful Effort.*

(1.) It is, however, an agreeable duty to notice another and hitherto a more successful effort. The Sanitary Association of Manchester and Salford—including and supported by many of the more wealthy inhabitants, the dignitaries, civic and ecclesiastic, and the principal physicians and surgeons of that city and its suburbs—has for some years promoted inquiries in various departments of hygiene, leading to suggestions of great practical importance. It has afforded, by means of lectures and tracts, much beneficial advice and instruction to all classes. It has issued a series of papers of high scientific value and literary merit. Moreover, since 1860 it has published weekly returns of health and meteorology on a plan somewhat similar to that before tried in London, showing the new cases of disease and injury coming under treatment in each week at the various pauper, charitable, and penal institutions of Manchester and the adjoining districts. Quarterly and annual compilations have been recently added, and these valuable reports continue to be regularly supplied to the large manufacturing community which they so deeply concern. The unanimity of the authorities and medical officers is really surprising. From twenty-eight districts, hospitals, workhouses, and prisons, included within the limits of observation, there seems not to be a single return wanting for two years.[1]

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[1] For 1861 the honorary secretaries state that 'the manner in which the medical officers have carried out their part of the work may be judged from the fact that, since the undertaking was fairly started in September,

(2.) In a very interesting paper, already referred to, which Mr. Arthur Ransome read at the Medical Congress at Cambridge in 1864, he describes these returns as completed by the voluntary labour of thirty-nine gentlemen, mentioning also the singular fact that 'during the last three years only one contribution to the series has been omitted—one out of more than 6,000 returns.' At the recent meeting at Leamington, he announced 8,000 returns without more omissions. Occasional delays have occurred, but usually the deferred return is published in the week following that for which the other returns are made.

An element of special value in these tables is the number of deaths occurring among the cases reported. Thus, the comparison between sickness and mortality in the groups and classes of population observed is complete. This was not accomplished by the Metropolitan Association.

(3.) Yet there is a noticeable defect in the Manchester tables, doubtless unavoidable in the absence of a national organization. *The districts for registering births and deaths do not correspond territorially with the districts for medical relief.* There are, therefore, no means of comparing the total mortality and reproduction with the sickness publicly relieved in each registration district. In this respect the metropolis had the advantage; but, for reasons already given, the latter comparison has been applied chiefly to purposes of administration or matters of social economy, and has availed but little for sanitary science. The jealousy of anything like interference by the constituted authorities of Manchester was

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1860, not one of them has failed to supply his weekly contribution, and the result is such a series of medical statistics as have never been obtained before.'

For 1862, it is reported that 'week by week *every* column in the list of disease and death has been filled. None have been left vacant in the whole weekly series, thus giving it a value which no similar return has ever attained before.'

curiously exemplified by the manner in which a well-intended advance of the board of guardians was received by the Association. The board had passed a formal resolution requesting the medical officers of the union to make returns of the cases coming under their charge for the use of the Association. But the secretaries of the latter body felt it incumbent on them at once publicly to disclaim the necessity for any administrative pressure on officers who were already assisting heartily, and deprecated any approach to a compulsory measure, which would only annoy the contributors by implying a distrust in their willingness to supply the required information. The aid of the board was therefore declined.

(4.) It is well to observe, in passing, the much greater quantity and smaller intensity of the sickness relieved at the public cost in London, as compared with that reported in the northern districts. The Manchester Association, being regularly supplied with monthly returns from Marylebone, published tables and charts showing the relative amounts and fluctuations of various diseases in the two places. Now, though the population of Manchester and Salford is to that of Marylebone as $2\frac{4}{10}$ to 1, the new cases of sickness registered in the latter generally, and sometimes very considerably, exceed those returned by the former.[1]

(5.) The learned authors of the Manchester reports assume a tolerably constant relation of sickness to mortality, and therefore suppose that this disproportion may be accounted for, either by the greater facilities which exist in London for obtaining gratuitous medical relief, or by the greater ex-

[1] 'The population of St. Marylebone, by the last census, is 161,609; that of Manchester and Salford, 390,815; yet the number of new cases of disease attended every month in St. Marylebone exceeds in the average those attended in Manchester by more than 1,600.' [*Analysis of Weekly Returns, page* 6, *Manchester Report*, 1862.] In the quarter ending June 25, 1864, Marylebone had slightly the advantage, the monthly average there being 5,525, and in Manchester 6,030.

tent of the club system in Manchester and the independent disinclination of its working classes to avail themselves of medical charity. But, in my opinion, neither a spirit of non-dependence on medical relief—which generally means dependence on druggists and quacks—nor its self-provision by the workpeople is sufficient to account for the remarkable difference in the amount of sickness publicly provided for in the two cities. Were the facts thoroughly sifted, the conclusion would probably support the theory that, under the existing conditions of our town populations, 'a diminution in the rate of mortality will be found to co-exist generally with an augmentation of the rate of sickness.'[1] The death-rate of Marylebone, according to the late officer of health, was about 23 per 1,000; that of Manchester seems to be about 32. *The amount of registered sickness is in inverse ratio.* This is one of the many instances which might be cited to prove the error of estimating the unhealthiness of places by Mr. Edmonds's supposed law—'*two* years of sickness to each death'; or by Mr. Neison's more recent and extensive inquiries, the result of which gives *three* years of sickness to each death among male members of friendly societies.[2]

§ V.—*How Sickness should be registered.*

(1.) The preceding sketches of two remarkable attempts to register sickness on the voluntary principle may be of use in the construction of a permanent system. In the meantime it is fair to speculate a little, for it is not easy to say why a combined effort of earnest workers should have succeeded so well for now (1866) more than ten years in Manchester,

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[1] III. 'A Defence,' &c., p. 35.

[2] Table E, Males, gives the average (for all ages) nearly two weeks of sickness *per annum* to each; or 38 years of sickness to 1,000 years of life. The average mortality at all ages was 12½ per 1,000. The proportion is, therefore, three years of sickness to one death. (Neison, p. 27.)

while its predecessor did not survive two years in London. Are the men of the northern manufacturing metropolis characterized by greater energy and public spirit? Do they pull together more comfortably and effectively because they are under no local boards? Are these disinterested labours of the medical profession more justly appreciated and heartily supported by the educated classes in Manchester than elsewhere? After all, does success in a co-operative undertaking of this kind depend in any degree upon the extent of its sphere; and would Manchester break down as London has done were it as large and its population as diversified? Or, again, is it a mere question of time; and can we reasonably expect that this most creditable effort of the Manchester doctors will be continued with equal prosperity and success for many years longer?

(2.) Whatever may be the motive principle or the ultimate issue of this work, I have no doubt that the registration of sickness now in progress among certain classes in Manchester is an exceptional phenomenon, and that in the towns and districts of England generally a similar want of organization by legal authority would be fatal to the scheme. Great enterprises, depending wholly on the spirit, talent, and personal influence of popular leaders, have generally failed in the long run, unless founded on some absorbing political idea, or military passion, or soul-stirring religious dogma.

If the past be an interpreter of the future, it may be safely predicted of a voluntary association—formed for the purpose of relieving the whole community from its just liability and proper duty, by shifting the public burden on to private shoulders—that it will ultimately fail in its object, and will have to be superseded by a municipal or national organization. Especially, if the object be to record and publish the leading facts of social life and progress, the most zealous efforts of a few philanthropists cannot permanently

supply that constant and definite information which the public ought to possess.

(3.) As a contribution towards the settlement of this question, I venture to lay down a few primary and essential limitations and conditions, which I think will be admitted by all who have thought or written on the registration of sickness, and who have impartially observed what has been done or left undone by the various bodies which have hitherto attempted to grapple with it.

(*a.*) For years to come it will be nearly impossible to obtain statistics of disease in every class of the community. The comparison of mortality with sickness can therefore only be partial at present. All that can now be done, under the best arrangements, is to record the sickness treated at the public cost and by associated charity and by mutual assurance. The total amount thus treated does not, in general, greatly exceed *half* the sickness actually existing in the whole population.

(*b.*) The contributors of facts should be supplied with tabular forms on an uniform plan, devised by competent authority, all reasonable expenses of registry, collection, and analysis being borne by the public. In addition to the personal particulars usually recorded about each patient, special provision should be made for registering those circumstances of the case which materially concern the causation and prevention of disease. Thus, whenever the facts can be ascertained, the record should show the parentage and birthplace of the sick person, also his occupation, habits, and manner of life, his condition or class, and his dwelling-place. It is often essential to know the precise locality from whence the applicant comes for medical relief. Antecedent maladies and the previous duration of present sickness should always be recorded. The results of treatment ought to be distinctly stated; not merely the mortality among the cases observed and the modes of death, about which there need be no mis-

take; but also, for the vast majority of patients, either the recovery, or the degree of improvement, or the mere relief or progress of disease, which may be fairly reported on their discharge; and a method of entry should be employed, which might make it comparatively easy to trace patients from one source of medical relief to another.

(*c.*) The nomenclature of disease is now in a very unsettled state, partly owing to the scientific refinements of Dr. Farr's ingenious nosology, partly to the want of universally admitted principles of arrangement, partly to carelessness of diagnosis, and partly to the fact that many minor ailments have no place in a classification dealing only with those more serious diseases and injuries which are liable to terminate fatally. It is therefore of the first importance that regulations should be issued by authority, naming, if not classifying, diseases on natural, simple, and well-understood principles, and avoiding terms and systems which involve the adoption of any new pathological doctrines.

(*d.*) The persons appointed to collect and analyze these returns must be qualified by a medical education, and accustomed to scientific and sanitary research. They should be the very officers whose duty it would be, on my plan, to inspect the registration of births and deaths, and to aid coroners and others in inquiring into the causes of suspicious deaths.

(*e.*) Any staff of officers organized for this purpose should be empowered to collect returns of the sick and hurt from *all* establishments, societies, and districts in which medical aid is afforded to the poorer or the working classes of society. Mere pauper returns can lead only to false inferences about the health of *town* populations. Mere medical charity returns ignore the great bulk of what is done for the sick poor in *rural* populations. Both together would fail to afford the required information about sickness and its causes among the working classes, unless provident and friendly societies could

be induced to co-operate. There would be but little difficulty in adding the facts relating to sickness among labourers in various departments of the public service, in penal and corrective establishments, and in elementary and industrial schools supported by rates or national grants.

(*f.*) No legislative project would deserve support, if it proposed to seize the raw materials and send them off straight to be engulfed in some central office in the metropolis; still less, if it meant to distribute the various returns among several Government departments—that is to say, if the schedules of pauper sickness were to be forwarded only to the Poor Law Board, and the medical-charity reports to some new department, as has been more than once suggested by men of mark in London, thus making the task of recovering the dispersed materials for local use more difficult and laborious. The several returns for each place must be examined, corrected, published, and utilized forthwith, *in the district to which they relate;* yet, after revision and verification, duplicates should be sent to the Central Department and the General Register Office for comparison with other districts, both for general conclusions respecting the public health, and for particular suggestions to localities.

[1875.—It would be wrong to quit this part of my subject without referring to the excellent work done in behalf of a national registration of disease by a Committee of the British Medical Association appointed at Leamington in 1865, at the instance of Dr. A. Ransome, who during ten successive years has prepared valuable reports for his committee on this subject. These reports are published in August yearly in the British Medical Journal, and have uniformly received the entire and hearty assent of the Association. Their practical suggestions are identical in principle with those here advocated, and their statements of progress may be thus described.

The system at first recommended for general adoption was one of voluntary co-operative effort, such as has been carried on for now twenty years by the Manchester and Salford Sanitary Asso-

ciation, aided by Mr. Whitmore, the energetic health officer of Marylebone, London; and for shorter periods, in Newcastle and the neighbourhood, by the Northumberland and Durham Medical Society, under the auspices of our able colleague, Dr. Philipson, and in Birmingham by Dr. Hill, the eminent health officer and analyst for that borough.

The returns were to be made by the medical officers of public and charitable institutions, as well as by those of the Poor Law Unions. The forms were to be supplied by the Council of the Association. At first certain diseases were to be selected for registration, 'all other diseases' and 'accidents' being noted separately. The districts were to be based on those for births, deaths, and marriages, and the undertaking was to be in support of Dr. Farr's proposal, that a registration medical officer should be appointed for each district. In subsequent reports uniformity of nomenclature was proposed, as in Miss Nightingale's excellent scheme, but on a simpler plan.

In two or three years, however, it became clear to the committee that the aid of the Legislature must be invoked, as voluntary efforts were unequal to the general extension of the system; and that a national organization on the proposed basis must be established. Accordingly, in 1870, and afterwards, successive deputations, memorials, petitions, and other appeals were sent to the Royal Sanitary Commission, the Poor Law Board, the Government, the House of Commons, and lastly, to the Local Government Board.

The importance of this reform to the public interests and to the advance of Sanitary Science, was repeatedly urged; the success of the undertaking in certain extensive localities was proved, the principle of uniformity of returns under a central registration department with superintending officers in districts, was shown to be necessary; and the employment of the medical staffs of the unions and public institutions with adequate remuneration, and under such superintendence, was demanded.

The Ministers of State who were addressed, acknowledged the great advantage of the project, and the Royal Sanitary Commission argued in its favour. But 'no definite plan was decided on for obtaining the objects set forth, nor was any arrangement made for transmitting the records through a district officer of health.'

Meanwhile some voluntary returns ceased, first from Newcastle,

and then from Birmingham, while the unsatisfactory proposals in Sir Charles Adderley's Bills, and the contemptible provisions of Mr. Stansfeld's Act, still leave the subject in a wholly unsettled condition.

The last Report of this Committee [B. M. Journal, August 22, 1874, p. 246,] so thoroughly exposes the present unsatisfactory state of the question, that I subjoin it :—

REPORT OF THE COMMITTEE ON THE REGISTRATION OF DISEASE.

In accordance with a resolution passed at the last annual meeting of the British Medical Association in London, a memorial has been presented to the President of the Local Government Board, praying for the establishment of a 'National System of Registration of Disease,' and a petition to the same effect has been laid before the House of Commons by Dr. Lyon Playfair.

The urgent need of such a registration of sickness is abundantly proved by reference to most of the reports of the numerous medical officers of health appointed under the Public Health Act of 1872. Many of these officers complain of 'the want of early information of the outbreak of infectious or epidemic disease' in their districts; and that there are no 'records of disease at their disposal;' 'no contributors to supply them carefully and promptly with statistics of sickness and mortality, or to announce the presence of epidemic disease.'

Attempts have, indeed, been made by the Local Government Board to satisfy these demands, by empowering the clerks to the guardians to copy out the entries of all new cases of disease reported at each meeting of the guardians, and to forward these returns to the medical officers of health within the several unions; but it has been pointed out by several of the more experienced of these officers that such returns are of little practical value; that, as one eminent writer says (B.M. Journal, May 30th, page 717), 'they are an inefficient and fallacious provision, and cannot secure an accurate, scientific, and trustworthy record of disease,' and that whilst, on the one hand, it is unjust to the Poor Law medical staff thus to appropriate their information, without payment, and without any means of correction, the health officers, on the other hand, cannot obtain from these returns the details that are often essential for the suppression of disease; it is furthermore most important that these records should be sent direct to the medical officer of health.

In the recently passed Sanitary Laws Amendment Act, no provision is made for preventing the spread of infectious diseases, either by the isolation of the sick, or by providing for speedy information of new cases of infectious disorders.

It appears, from a recent parliamentary return moved for by Mr. W. H. Smith, that the deaths in England alone from zymotic diseases amount to 111,000 annually, and it is probable that the number of persons attacked is at least six times as great.

Without a systematic registration of these attacks, it is hopeless to attempt to suppress outbreaks of epidemic disease; and your Committee would call attention to a proposal for the compulsory notification of all cases of infectious

disorders, made in the first instance by the Manchester and Salford Sanitary Association, and since approved by the Joint Committee of this and the Social Science Associations on State Medicine.

With regard to the difficult subject of the remuneration of contributors of returns of disease, your Committee would suggest that public medical officers, whether belonging to the Poor Law Medical Service, or attached to gaols, hospitals, dispensaries, or provident clubs, should either be paid at the rate of twopence or threepence for each case recorded by them, or should receive, as some slight acknowledgment of their services, a sum varying from two to four guineas *per annum* for such satisfactory weekly returns of all new cases of disease as might be deemed needful by the Local Government Board.]

(4.) To revert briefly to some of the grounds for this project. Considering the ignorance and misapprehension which so commonly prevail on this subject, it cannot be too often impressed on the public mind that 'a mere mortality return is no index to the health of a district,'[1] and that conversely, the prevalence of an epidemic by no means implies an increase of the death-rate. 'There are seasons in which, even though sickness proves very general, the mortality is not excessive.'[2] A comparatively mild epidemic, with its more numerous survivors, may entail a larger and heavier burden of unhealthiness upon a community than a most deadly pestilence with its fewer survivors.[3] Seasons of drought, of famine, or of flood may display at the time but very short death-rolls.[4] Shallow reasoners upon such events may infer that the public health has not suffered. They may even assume that some ephemeral change of circumstances or of social habits, under the disaster, has actually lengthened the lives of the sufferers; but unless the people are really made more hardy and vigorous by their misfortunes, wiser in food and drink, and more frugal in their manner of life; unless, also, their conditions of labour

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[1] See an able document on Registration by the Irish College of Physicians. 1863.

[2] Manchester San. Assoc. Rep. 1865. p. 7.

[3] See III. 'A Defence,' &c., p. 12, *loc. cit.*

[4] Observe the diminution of mortality during the Lancashire famine in the American civil war.

and habitation are greatly improved, their closeness of aggregation in towns and their overcrowding in houses diminished, and out-door employment more generally provided; again, unless women are withdrawn from the labour market, and encouraged to obey their maternal instincts in the better care and nurture of their offspring;—the specious bubble will burst sooner or later, and the real effects of such social calamities will surely be revealed in time by some startling, though perhaps not sudden, increase of the death-roll, from an enfeebled and degenerate population.

[1875.—It must be recollected that my original remarks, here and elsewhere in this Essay, were published ten years ago, and that in the interval important improvements have been effected, especially by the Registration Act of 1874, and its administration. The remarks in the next section are, however, retained, partly to show how much has been effected by the new Act. But the improvements themselves relate wholly to Births and Deaths, and will be noticed hereafter.[1]]

§ VI.—*How the Causes of Death are Registered.*

(1.) In the absence of a public registration of disease, we may be told that, at all events, the more serious sickness which ends in death is recorded in the certificate of the cause of death, which every medical practitioner in England is expected [1865], in Ireland is required by law, and in Scotland is forced under penalty, to supply gratuitously for the public good in every fatal case attended by him.

Of this authorized certification enough has been said by many competent observers to show that its real value has been greatly overrated, and that its results have not fulfilled the sanguine expectations of its early advocates.

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[1] The reader is referred especially to a Paper of mine in 1872, reprinted at the end of 'Fallacies of Vital and Sanitary Statistics,' in this volume.

(2.) In some former remarks on this subject,[1] I drew attention to the many fallacies involved in applying the term 'cause of death' to that description of the mortal disease or of its last manifestations which is given generally in these medical certificates. In Northern Germany the law requires, with greater truth and logical exactness, a certificate only of the manner of death—*Todes-art.* Deferring for a few pages some further observations on this source of error, I proceed first to notice the proportion of deaths in England, the so-called cause of which is medically certified.

A few numerical details may give some idea of the amount of mortality which escapes inquiry. In 1858 Dr. Farr supplied us with valuable statistics on the subject. 8,734 persons died and were buried in that year without any record —whether by medical practitioner, coroner, casual informant, nurse, or kin—of the nature of the last illness or injury; that is to say, 1·94 *per cent.* of the total deaths in the year. But the number buried without any medical or legal report of the 'cause' was far greater. Dr. Farr confessed it to be 20 *per cent.*, or more than ten times the number of those in which no statement whatever of the mode of death was registered. 'It is near the truth to state,' said he, 'that the nature of that illness was described by men professionally qualified to give the information, in about 80 *per cent.* of the total number of deaths.'[2] 87,000 persons at least were therefore buried in that year without a medical certificate!

In 1862, 7,566 deaths or 1·73 *per cent.* were registered without any statement of the 'cause.' Ten times that percentage, as before, would give more than 75,000 deaths uncertified by medical authority. Let us take the latter number, and deducting the cases—about 22,000 per annum —returned by the coroners, not because the cause of death

[1] III. 'A Defence,' &c., pp. 4, 5, 6.
[2] Reg. Gen. Rep., xxi., p. 203.

is determined correctly, or even reasonably, in the majority of inquests, but to avoid any chance of exaggeration, there still remain more than 50,000 corpses buried or otherwise disposed of in the year without any scientific inquiry or authentic record concerning the disease or casualty which shortened life.

(4.) Doubtless in districts wherein health officers are actively employed, as in the metropolis, and perhaps in a few other places where some statistical meddler or enthusiastic sanitarian is permitted to overhaul the registers, the ratio of deaths without some pretence of certification may be much smaller; but the appalling fact remains that in most of the crowded and neglected districts of England,—especially in the great towns of the north, where doctors are at a discount, and unlicensed medicasters are in demand, and nurse-gossips, those 'props of the national registry,'[1] are triumphant,—a very large proportion of burials takes place without any description of the cause or even mode of death, either by medical report or by coroner's inquest. The Act simply requires that some person present at the death or in attendance during the last illness, or, in default of all such persons, the occupier, or, if he be the dead person, some inmate of the house or tenement in which the death happens, shall within eight days give information, upon being requested to do so, to the registrar, of the several particulars required to be registered concerning the death. The registrar is bound to inform himself about these particulars, even, if necessary, by going to the spot, and all persons are bound to answer his questions. Any person giving false information is liable to be punished. Among these particulars is 'the cause of death;' but the medical attendant, if there were one, is not under any legal obligation to give a scientific description of this cause; nor is the registrar

[1] Mr. Alfred Aspland on National Mortuary Returns, p. 5.

bound to obtain a medical certificate. Thus only one person is required by law to give the specified information in order to obtain the registrar's certificate necessary for the burial. Such testimony may be and often is utterly worthless. Either ignorant of the nature of the facts they report, or not choosing to relate all they know, many of these informants tell their crude stories to registrars, who in general are quite incompetent to detect a flaw or rectify an obvious error in the tale. In England, about one in seven or eight registrars, on the average, belongs to the medical profession (for it is only in Ireland that this inferior appointment is coveted by the general body of physicians and surgeons); and even in the few sub-districts where the registrar happens to possess a medical qualification, he is not required, nor would the paltry remuneration of his office warrant his being required, to investigate the truth of every unintelligible or doubtful report about a death,—still less, to visit and inspect the corpse. Of course no registrar would be justified in recording any suppositions of his own in the matter; and thus any nonsensical or unfounded or faulty statement may be inserted by the registrar as the cause of death, for the benefit of—the Registrar General.

(5.) Infantile mortality is distinguished by a most alarming scarcity of medical certification. Among the multitude of victims to exposure, starvation, slow poisoning by gin or opium, and maternal neglect, there are doubtless many cases in which it is an object to obtain a registrar's certificate for burial, but in general any appeal to medical knowledge and discrimination is carefully shunned. I say nothing here of proved infanticide, and of the horrible evils of baby-farming, although it is quite certain that a large amount of deliberate destruction of infant life escapes the legal verdict of 'wilful murder.' The statistics of coroners' inquests avail little, and are not worth citing on this point. Nothing, indeed, is

known concerning the circumstances and causes of a large proportion of deaths among the children of the destitute classes, chiefly because they were never registered either as births or deaths. The registration of births not being obligatory and still-births not being recorded, a terrible uncertainty exists both as to the number of those who perish during the earliest days of life (even after birth at the full time) and as to the manner of their fate. Who can enumerate that progeny which is not reckoned among the living? the 'hidden untimely births,' the 'infants which never saw light.' The sad inquiry can be answered only approximately where still-births are separately registered, as they are in France and Germany, and as they ought to be in England. It is satisfactory, however, to find that Dr. Farr does not consider this extension of our registry impracticable.

Many of these alleged still-births are brought for burial without any guarantee that they were still-born.

The real number of cases in which the chance of life is criminally or negligently destroyed, at or soon after birth, may never be ascertained, even under the best administrative regulations. But the English method undoubtedly offers a premium to misrepresentation and crime; and events are occurring with frightful rapidity to establish the truth of Dr. Lankester's remark, that 'where women can find accomplices, this system presents a very ready method of getting rid of children without any inquiry as to the cause of death.'[1]

[1873.—The Act passed in the last session for the better protection of infant life, has provided adequate remedies for those serious abuses which have arisen from the unregulated trade of infant maintenance carried on by unprincipled and ignorant nurses. That the righteous war against baby-farming was conducted to a successful issue is greatly due to the able and vigorous efforts of Mr. Ernest Hart.]

[1] First Annual Report of the Coroner for Middlesex, &c. p. 76.

(6.) Again, there are cases in which medical men are applied to for certificates of the cause of death, but for very sufficient reasons refuse to grant them. Absolute reticence is better than a vague reiteration of assertions made by illiterate attendants or interested kinsfolk. Thus, in many ways, 'a loop-hole has been left for the careless and guilty, a loop-hole which makes the whole system of registration, in so far as it is connected with the public safety, a solemn farce.'[1]

Yet the deficiency of medical certification does not depend upon any want of pressure—at least of moral pressure—brought to bear upon the medical profession. In the absence of the legal compulsion inflicted upon the practitioners of Scotland [1875, now the United Kingdom], no means have been spared to extract the certificate from every English doctor. The chiefs of the medical corporations, in 1837, headed an influential movement in support of a scientific registration of mortality; and after exposing the objections of some three or four individuals out of the 'inconsiderable number—perhaps fifty persons—of the medical profession' who had refused to return the cause of death, the Registrar-General in 1845 penned the following remarks :—[The italics are mine.]

'That it is the duty of the State to require from the medical attendants and to register the cause of every individual's death which takes place in the country, appears to me incontestable; and, as I have stated, I have found that the profession as a body, comprising more than ten thousand qualified medical practitioners, and all the most eminent men in all the branches of the profession, physicians, surgeons, and general practitioners, have expressed their readiness to return the causes of death in the best way the present state of medical science and their means of procuring information will admit. I have given explicit instructions that no certificate shall be received from persons known to be unqualified, or to have no diploma from either the halls, colleges, or recognised universities; and

[1] Social Science Review, March, 1864.

I have determined not to attempt at present to compel the few medical practitioners who have refused to sign certificates to return the causes of their patients' deaths ; as, although they may have diplomas, it is probable that the information they would be induced to furnish would be of little comparative value, and might mingle errors among the facts spontaneously supplied by enlightened accurate observers. If the Legislature should appoint health officers to act with the coroners, and to inquire into the causes of the deaths of persons who are not attended medically at all, or are attended in fatal diseases by quacks and unqualified practitioners, *it may be thought right to inquire into the deaths of patients attended by men holding diplomas who refuse to state the causes of death to the best of their ability.*' (p. 3.)

The ingenious alternation of compliment and menace which characterises the preceding passage is not without present significance, even twenty years after its publication. That it is the duty of the State to compel any class or profession to render special services to the community, for which no return or remuneration is to be made, is perhaps not so 'incontestable' a proposition as the Registrar-General believed it to be. A principle so despotic is wholly inapplicable to ordinary times and purposes. It is justifiable only in great national emergencies, or in cases where an equivalent immunity or privilege is granted to the class compelled to serve. Yet it has been actually embodied in the Registration Act for Scotland, and it may again be suggested for England.[1] Nay more, within the last few months the Registrar-General has informed an eminent medico-legal authority that he 'shall be glad to see medical practitioners compelled to give not only written certificates of the cause of death, but also notices of all births attended by them.' Fortunately, however, in this part of the kingdom the matter has hitherto been left to the

[1] [1875.—The Registration Act of 1874 has now adopted this principle, erroneously as I believe. Certification of the 'cause' of death is now made compulsory, under penalty, on the medical practitioners of England.]

good feeling of the profession, and we must not complain of the results of nearly thirty years' trial of this voluntary service.

I propose hereafter to show how a thoroughly scientific mortuary registration might be secured without trenching in any way upon professional freedom of action.

(7.) Dr. Lankester, in or before 1864, suggested[1] that, 'in consideration of their titles being recognized, and their right to practise secured by the State, the medical profession, in return for this recognition and security, would not object to undertake, as one of the conditions of their registration, to give certificates of all births and deaths in which their professional services have been required;' in other words, that medical men might be induced, in return for State recognition, to submit to be compelled to give gratuitously certificates of births, causes of death, and vaccinations.

In noticing this questionable proposition, I do not hesitate to express my doubts as to the justice or political expediency of protecting the medical profession more stringently against unqualified pretenders, by depriving these of their right to practise among the fools who choose to employ them. I do not admit that any such recognition or protection by the State, as qualified practitioners are likely to obtain from Parliament, would compensate them for the imposition of additional public burdens. The advantage of the former is very problematical; the latter would be an oppressive certainty. The cost of the 'Medical Register,' whatever may be its present or prospective advantages to registered practitioners, is borne wholly by themselves. They ought not to be required to contribute any more, either in money or by service, for so very doubtful a privilege as exclusive legal recognition. The benefit of a really good Medical Register would be felt chiefly by the public.

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[1] Second Annual Report, p. 198.

§ VII.—*The worth of Certificates of the Cause of Death?*

(1.) It has been shown that in England and Wales more than 50,000 persons have been perishing yearly without any authentic record—scientific or coronatorial—of the diseases, injuries, and casualties which destroyed them.

Now, we may frankly admit that there are many districts in which the returns of the so-called causes of death are certified with considerable uniformity and regularity; but then how very great must be the deficiency of proper record in the rest! In some places, more than one-fifth of the deaths escape professional notice. We have no means of ascertaining exactly the varying proportion, in different districts, which medical certificates bear to deaths; but we may be sure that, in general, wherever the masses are in the most neglected and debased condition, the true causes of disease and mortality, although needing the most searching investigation, remain in the greatest obscurity; and there, also, we may expect to find a larger proportion of inferior certificates, less reliable as to the actual phenomena of dissolution, less scientific in the endeavour to indicate the cause.

(2.) We may readily concede, on Dr. Farr's authority, that on the whole a marked improvement has already taken place in the character and value of these returns, and that this improvement is progressive. We may safely assume that there are now fewer instances of absurd ignorance than were quoted in the official pamphlet containing the 'Statistical Nosology," which was published in 1845.[1] We may believe that the fatal disease or accident is described more correctly and faithfully than it would have been under an arbitrary system of compulsion without compensation; for, as the

[1] Such names as 'bleeves,' 'hives,' 'span of the back,' 'twist in the bowels,' 'giving out of the heart,' 'blue fever,' 'black cramp,' 'chance medley,' 'morbosity,' &c., &c., are rarely, it may be hoped, returned at the present time.

Registrar-General very judiciously observed, 'It is probable that the information,' supplied by recusant practitioners certifying under coercion, 'would be of little comparative value, and might mingle errors among the facts spontaneously supplied by enlightened accurate observers.' We may also gratefully acknowledge the benefit of a wide diffusion of nosological information by means of the official instructions, circulated twenty years ago. Probably no learned professor ever secured the attention of so large a class of intelligent students as Dr. Farr found among the 10,000 medical practitioners, coroners and registrars, most of whom must have perceived more or less clearly the necessity for some acquaintance with his new nomenclature and classification.

By distributing a mass of useful though but elementary instruction, condensed in brief definitions, suggestive notes, and striking examples, Dr. Farr did more than all preceding systematists to facilitate diagnosis, to promote exactness in description, and to popularize the first principles of scientific nosology.

(3.) Notwithstanding all these ready concessions, however, there is good reason to believe that the voluminous records of the 'causes of death' issuing yearly from the General Register Office are not to be relied on as positive evidence of the number of deaths justly attributable to each of the many forms of disease and violence entered on those lists.

There are two main sources of error in the published tables. The first lies in the certification, the second in the classification of 'causes.' We have much distinct evidence of the former fallacy, much reasonable certainty of the latter.

As to medical certification, the few who are behind the scenes of the official drama could tell no more than is generally known about it. Officers of health and others, who are occasionally permitted to examine the registers, have stated that, in a large proportion of cases, the certificate affords no

satisfactory information concerning the real cause of death, and nothing whatever about the cause and nature of the original disease. Testimony of the most decisive kind has long been accumulating on this point; and it has been recently confirmed by a well-known sanitary statist, who lives in an extensive district, comprising both town and country populations, and who has peculiar opportunities, under an exceptional arrangement, of examining the mortuary returns. This gentleman asserts, from personal knowledge of the cases, that 'many of the certificates are inaccurate, many altogether erroneous.' He says that the only class of certificates to be invariably relied on are those of deaths in hospitals. It is obvious to anyone, indeed, that, in well-managed public institutions for the relief of the sick poor, there is the best scientific agency to detect and describe the causes of disease and death, *and the least inducement to conceal or misrepresent them.* Motives of this nature operate, perhaps unavoidably, among the medical attendants of the middle and upper classes of society, and to a greater extent than is supposed by official people. A Conservative objection to the Births and Deaths Registration Bill for Ireland (1861) was that one of the clauses 'would render it compulsory on doctors for the fee of a shilling to furnish details of family events, at which they were called upon professionally to assist.'[1] These 'family events' are often embarrassing to more than one party, and the medical attendant might be glad to be excused the disagreeable duty of attesting them. The awkwardness of his situation is felt with especial force in Scotland, where a tyrannical law forces him to certify *something.*

At a meeting of the Glasgow Faculty of Medicine,[2] Dr.

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[1] Mr. Whiteside's Speech, House of Commons, April, 1861.

[2] 'Lancet,' March 9, 1861, p. 252.

Chalmers stated, as a fact which no one could doubt, that certificates of the cause of death were

'in a very great number of cases worded not so as to give correct information to the registrar, but in a manner to please the friends and family of the deceased. . . . . Only a few days ago a friend of mine, a highly respectable London practitioner, gave as the cause of death in a case which I had seen with him, "gastro-enteric disease," a rather ambiguous expression, whereas the case was undoubtedly one of chronic poisoning by alcohol, the gentleman having been notoriously a hard drinker for a considerable time. On my remonstrating with the surgeon, he replied, "What can I do? It is impossible for me to put the real cause in the certificate; the family would never forgive me."'

It appears that Dr. Chalmers suggested that, if the medical attendant were directed to forward the certificate confidentially to the registrar, instead of committing it to the survivors or family of the deceased, the statistics of the Registrar-General would be more accurate, and the conscience of the practitioner clearer.

No sufficient reason has ever been adduced for allowing the medical certificate to be employed in any way, or even read, by the registrar of the sub-district. The professed objects of scientific registration cannot be promoted by a blundering copy of an often illegible certificate. At all events, the medical attendant ought to be released from his false position of responsibility to the friends of the deceased in the performance of his duty to the State. But there is, as we shall see, a more effectual method of attaining the desired object than that proposed by Dr. Chalmers.

(4.) The medical profession is not more actuated by sordid or personal considerations than any other body of men; but we may safely and not uncharitably assume that many medical certifiers yield to the disturbing influence; and thus a main cause of the fatal event may be concealed, when supposed to be discreditable, either to the habits of the

deceased, or to the hereditary and constitutional tendencies of his family, or to the nature of the locality or sanitary condition of the house. In any one of these cases the attack immediately preceding death, or the series of morbid changes which terminated fatally, might probably have been prevented; and if returns of the so-called causes of death, medically certified, are intended to bear upon ætiology or the prevention of disease (and this is not a settled point), the real causes, however remote or complex, must be stated in the certificate. But is all this possible?

The particular preventive measures which might be suggested by the discovery of a preventible cause of disease might come under either private and personal hygiène, or educational and domestic hygiène, or social and public hygiène; but, anyhow, the lesson is lost when the primary source of mischief is not traced; and the present irregular system of mortuary certification, *without a separate registration of sickness*, tends to conceal the causation and ignore the preventibility of disease, quite as much as though merely the proximate cause, or the manner of death were certified.

Again, in a vast number of instances the certifier has been afforded no fair opportunity of forming a diagnosis of the earlier stages and forms of disease. Medical men, when called in to the dying or the dead, just to save appearances, are fully justified in reporting the 'cause' as 'unknown.'

Again, the mere manner of death is occasionally certified, as an act of kindness to an imploring relative, by some practitioner who has not even visited the case; the actual attendant, if there were such, perhaps not having been asked, or perhaps not choosing to certify, for reasons best known to himself or the survivors. As the masses of town populations grow larger and denser and poorer, the obvious tendency of medical certification is to deteriorate. Many a workhouse medical officer or hospital house-surgeon can only

write 'dying when admitted,' no evidence being afforded as to the antecedent circumstances. The final manifestations of a fatal disease may doubtless avail to correct the diagnosis of a practitioner who had observed the case through all its stages;[1] but this does not suffice to vindicate a system which is indiscriminately applied to all cases, although in the majority disease has not been watched from its beginning nor traced through its developments, and in some instances has been barely seen at its end, by the medical man who gives the certificate. It is unnecessary to dwell on the utter worthlessness of opinions derived from the inaccurate statements of survivors or bystanders, or to quote, as it were easy to do, any other ridiculous instances of vague and unlearned certificates. It sounds like a grim joke to declare that some one died of 'want of vitality.' Nor is any but a purely statistical object gained by the certifying that some one else died of 'asphyxia'; for the parade of an imposing Greek word does not show why the pulse stopped.

The present opportunity may be more usefully employed in showing the unsuitableness of a scientific classification of diseases, for the simple object of describing the immediate cause of death.

§ VIII.—*What is a 'Statistical Nosology'?*

This is no place for a purely technical discussion, but I cannot forbear making use of the current controversy touching our official nosology, in order to expose some remarkable sources of fallacy in the English system.

The very title which the Registrar-General has given to his classified list of mortal maladies—'A Statistical Nosology'—seems to involve at least an unreality. Statistics, or the use of the numerical method in matters affecting the State, is correctly and advantageously applied to the deaths of a

[1] Dr. Farr, Soc. Sci. Trans., 1859, p. 616.

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population, as well as to its births, marriages, lifetimes, &c.; the units or single events being arranged in groups or classes for the purposes of analysis and comparison, or for practical deductions. These several groups, however, must be distinguished by certain indisputable properties or characters; great care must be taken that all events to which the same specific definition can be applied are included in a single group; and there must be no question about the specific character of each unit so included. Thus sex, age, dwelling place, occupation, seasons, and climate, and perhaps other known conditions of human life, in their various combinations, may be rightly and conveniently employed to distinguish a multitude of groups of the living and the dead. By the aid of algebraic formulæ and processes, a number of statistical feats, astonishing if not useful, may be performed with these groups. But no such process can be applied to disease. Even the various attacks of sickness which each deceased person may have endured before death cannot be made the subject of statistics until they have been defined and enumerated.

On the other hand, the science of naming and classifying maladies is not yet sufficiently exact to admit of being either used or abused by arithmeticians. The very principles on which the long list of ailments and injuries incidental to our race should be defined and tabulated, are as yet undetermined.

Medical ingenuity has been employed certainly for more than a century in the construction of nosological systems. From that of Sauvages, the first methodical nosologist, to that of Cullen,[1] whose admirable definitions will long survive

[1] The original Latin edition of Cullen's Synopsis (2 vols. 1785) contains a full description of the systems of his learned predecessors, Sauvages, Linnæus, Vogel, Sagar, and Macbride. The curious inquirer may find in that great work the foundations of all modern systems.

his arrangement, and onwards to Mason Good, whose speculative classification was unfitted, by its novel and pedantic terminology, for practical use at any time, and whose boldest innovations have been superseded by later and sounder observations—no single system has stood the tests of time and change, or outlived the invasion of new cohorts of fevers, the retreat or altered type of old diseases, the scientific refinements of a later investigation, the ever new discoveries in pathology, and, I may add, even the varying fashions of the medical art. But setting aside the verbal objection, and admitting under protest the use of the term now understood to be something in which both statistics and nosology are concerned, it will be more to my purpose to review briefly the circumstances which have led to the present anarchy of opinion on this subject.

§ IX.—*A Continental Excursion.—Brussels and Paris.*

It is now (1865) more than ten years since the *vexata quæstio*—how fatal diseases ought to be named and classed—was again forced upon the attention of statists by the introduction of a new version of the Registrar-General's 'Statistical Nosology.' At that time the medical profession in England had become accustomed, if not reconciled, to the nomenclature which had been for fifteen years in use; but the objections occasionally made to the earlier classification were mild in comparison to the vehement criticism which the latter encountered, as step by step it developed in successive reports from the General Register Office.

The controversy would probably have been limited to this country but for the International Statistical Congress, which met first at Brussels in 1853. The nosological discussion commenced in real earnest at the second Congress at Paris in 1855. Here the rival projects of Farr and Marc d'Espine

competed for European approval. Those learned men, so eminently qualified for the task, by profound knowledge and long official experience, had been commissioned at Brussels to prepare a uniform nomenclature of the causes of death, applicable to every country. Not satisfied with this arduous undertaking, they attempted also a uniform classification of those causes; but, after repeated interchange of propositions, these gentlemen found their differences as to the principles of arrangement to be irreconcilable. The one rested his scheme mainly on the distinction between epidemic, sporadic, and constitutional maladies; the other on that between acute and chronic diseases;—the former principle being that adopted in England and the department of the Seine, the latter in Geneva and the German States. The efforts of the section at Paris in prolonged debate proved equally fruitless. It was impossible to obtain general assent to any nosological classification. All that could be accomplished was the formation of a catalogue of names, in agreeing to which each of the principal parties surrendered his own project of grouping, while assenting to a distribution of these 'causes of death' for administrative purposes, under seven divisions, of which only one was devoted to fatal diseases, distinctly specified; that is to say, all deaths from known and well-defined maladies were left in one division, *unclassified*.

(2.) It is impossible to speak too highly of the manner in which our distinguished countryman introduced his project to the Congress. One may well feel nationally proud of him. Animated, as he has always been, by an ardent desire to raise the standard of the people's health and longevity, he asserted that the principal object of mortuary tables was to measure the differences of health-condition in different localities, in each class of population, and under the influence of various circumstances,—to ascend from the fact of death

to the causes of insalubrity, so that these might be averted by sanitary measures. As a second and apparently subordinate object of statistical returns, he mentioned those deaths which might be traced to direct human agency, and which, being so returned, would rouse the attention of justice and evoke the counteraction of law. He did not conceal the many and great difficulties which surround the attempt to detect and attest the nature of diseases, the complication of morbid phenomena, the imperfection of diagnostic art, the total absence of medical observation in the course of many fatal maladies, and hence the impossibility of a rigorously exact registration of disease, in the actual condition of things. After stating his views as to the medical persons by whom and the methods in which the certificates of 'causes' should be drawn up, he offered some practical suggestions on nomenclature, with the object apparently of inducing observers to discover the primary cause of organic lesion.

The leading idea of the English statist seemed to be that a mortuary record might be converted into a registration of disease. Hence he included in his extended nomenclature a number of disorders and injuries which are not acknowledged causes of death, and thus doubled the length of the list given in the Registrar-General's tables. The advantage of such an addition to an already crowded schedule seemed more than doubtful. It was objected to by Dr. Marc d'Espine as tending to perplex the certifier and multiply the chances of error.

(3.) But on the knotty point of classification Dr. Farr expatiated more freely, as in his proper element. Allowing that the simple alphabetical order of the old Bills of Mortality would prevent a heap of intricate questions on which absolute conformity of opinion could never be hoped for, he urged that statistics being eminently a science of classification, it was important to group together kindred or

similar diseases in order to facilitate the deduction of general principles. Yet he confessed that the general principles of the therapeutist, of the pathologist, of the jurist, and (he might have added) of the statesman, would rest on entirely different bases; and that each must be allowed to observe the deaths of a community from his own point of view, and to class them in his own way. What then becomes of a classification founded on special views? Can this be properly called a national system?

One cannot fail to be impressed with Dr. Farr's eloquent description of the class which he calls 'Zymotic,'—that to which he clings most fondly, but which, like other pets, has brought him most into trouble with his friends. He said:—

'Les maladies de cette classe distinguent un pays d'un autre, une année d'une autre; elles prennent dans l'histoire une place considérable, et ainsi que Niebuhr l'a montré, elles exercent une certaine influence sur les destinées non seulement de villes telles qu' Athènes et Florence, mais encore d'Empires tout entiers. Elles déciment les armées, détruisent les flottes; en sévissant sur la population des prisons, elles tuent des hommes que souvent la justice n'a pas condamnés: elles redoublent les dangers que présente l'encombrement des hôpitaux. Elles infestent les habitations des pauvres; elles saisissent l'artisan dans la force de l'âge et le précipitent d'une aisance relative dans une misère incurable; elles arrachent du sein de sa mère l'enfant à la mamelle, et n'épargnent pas davantage le vieillard au déclin de la vie; enfin plusieurs d'entre elles sont particulièrement dangereuses pour les individus à la fleur ou dans toute la vigueur de l'âge.'

So poetical a view of popular diseases might tend rather to captivate than to convince the judgment, and it throws into shade the practical embarrassments which the creation of this heterogeneous class inflicts upon a statistical record of the immediate causes of death. For under the Zymotic flag are ranged not only the well-known epidemic, endemic, and contagious maladies, the fevers of old nosologists, the

parasitic or entozoic diseases of the new school, but also those which arise from insufficient nourishment, a singular array of deadly foes to man, which have no other resemblance or ground of alliance than their assumed but unproven origin and propagation by some sort of fermentation, a human or parasitical yeast. Yet does Dr. Farr protest against the etymon being accepted as a definition of the class, or the class being understood to include all fermentations.

His next is a sporadic class, 'constitutional' (*cachectici*); it includes many but not all which arise from original liability, inherited or acquired, diseases of the blood, &c.

Under his third division he presented a large class of local diseases (*monorganici*), both acute and chronic, divided into eight orders, each representing a different region or structure of the body. It differs generally from the second class in that its constituent maladies relate to the disorganization or derangement of a single organ, while the cachectici may invade many organs at once or successively. His fourth class, 'developmental' (*metamorphici*), may be considered as representing physiological causes of death, such as immature birth, the act of birth, fault of structure, innate debility; also diseases incident to the various epochs of life, as dentition, child-bearing, climacteric changes; and lastly, degeneration of tissues and senile atrophy. The theory of this group may be perfect, but there are many and great practical difficulties in its application to returns.

Violent deaths constitute Dr. Farr's fifth or medico-legal class. It comprehends the manifest results of distinct causes acting upon the human organism *from without*. It admits of division into orders on two different principles, and the abstractor of returns, in selecting one of the two, must hold himself bound by his choice, otherwise the same kind of death may be entered under two or more heads in

the classified abstract. On the one principle, external agency, human or other, serves as the basis of distribution.

'Ainsi un homme peut trouver une mort glorieuse sur le champ de bataille (I); il peut succomber à un homicide (meurtre, assassinat, II); il peut mourir ignominieusement sur un échafaud (III); abandonnant le poste que Dieu lui a confié, il peut se suicider (IV); enfin, (V), il peut mourir par *accident*.'

But a prolonged and intricate medico-legal inquiry is often necessary to determine whether the agency is suicide, homicide, or accident; and so momentous a verdict ought not to be anticipated by the medical certifier. On the other principle, the nature of the injury determines the subdivision; thus we have (1) chemical lesions, as extremes of cold, heat, lightning, &c.; (2) asphyxies, including suffocation by drowning, hanging, strangling, &c.; (3) physical lesions, all the wounds, contusions, and fractures which come under surgical treatment; (4) poisonings, by various kinds of metallic salts or vegetable substances; and (5) the bites or stings of venomous animals. To this division, also, some weighty objections have been urged.

(4.) In concluding his introductory remarks, Dr. Farr illustrates his arrangement by a striking analogy, with which I conclude my reference to this project:—

'Le statisticien se fera une idée des maladies des trois premières classes, en les comparant avec les désordres qui se produisent dans une machine parfaite, sous l'influence d'une action électrique ou chimique ou par le fait d'un long usage. La quatrième classe, pour continuer la même comparaison, correspond à un délabrement général dans la machine. La cinquième classe a son analogue dans une explosion de la machine, qui désagrège ses parties, et arrête définitivement son mouvement.'

It is right to say of Dr. Marc d'Espine's original project, that its character was fairly expressed by its title, '*causes de mort physiologiques*.' On this view, life from its earliest

spring to its close is considered as liable to pass into death by a few general modes of change, among which are reckoned organic disease and external violence. The manner of death rather than its cause is regarded on this theory, which ignores ætiology and hygiène, and has but little respect for pathology, and yet, for the statist holds out many advantages. The Genevan distributed his causes of mortality into eight divisions: (1) still born; (2) deaths soon after birth; (3) deaths from *age* or senile atrophy; (4) deaths from violence or *external* accident; (5) *sudden* deaths from internal causes (par accident morbide); (6) deaths from *acute* diseases; (7) from *chronic* maladies; (8) undetermined.

(5.) The Section to which the rival projects were submitted adopted a classification from Dr. Marc d'Espine, a nomenclature from Dr. Farr, and appointed the former as *rapporteur*. Honours were thus divided, but the Genevan took the odd trick. The fourth, fifth, and sixth divisions of the Swiss scheme were fused together, and then all the items redistributed into two large classes, one containing fatal maladies well defined, the other including those incompletely defined or designated only by prominent symptoms. In the latter, we find those cases of apoplexy, hæmorrhage, syncope, &c., which happen without any known organic lesion. The eighth division of Dr. Marc d'Espine's project became the seventh of that sanctioned by the Congress, but was limited to 'unknown causes.' In introducing the amended scheme to the Congress the learned reporter showed that the first object of the Section was a good nomenclature of the immediate or determining causes of death, and that a return of primary diseases and injuries was proposed as an important addition to mortuary statistics.

(6.) The simple division into acute and chronic diseases—characteristic of German and Swiss systems—is perhaps indefensible on pathological grounds; for maladies essentially

the same, and differing merely in the time required to fulfil their fatal mission, are rudely separated under different heads, and the same organ or structure of the body finds its peculiar affections scattered among several classes. But it has its public and social advantages. The duration of illness is an element of great importance in determining the effective strength of a population. Authentic information as to the comparative mortality and average duration of sickness in acute and chronic diseases, according to sex, age, social class, &c., would be invaluable to men of office. Dr. Farr admits that the medical jurist may reasonably class deaths according to their suddenness or slowness. The German principle of classification is strictly medico-legal. The jurisprudential aspect of each case is selected instead of the hygienic.

The names of diseases, in this curious list of 138 causes of death, are given in Latin (the universal language of learned men until discarded by the English College of Physicians) with synonyms in seven modern languages, making the nomenclature of the Parisian Congress a valuable addition to our nosological literature.[1] M. Parchappe thus describes the result of the consultation :—

'Ce catalogue n'a donc qu'un caractère provisoire, c'est vrai; il est imparfait, c'est incontestable; mais il est quelque chose, quelque chose qui a la consécration d'une discussion sérieuse et approfondie. En définitive, c'est plus que ce que l'on a en ce moment.'

A serious defect in the *compte rendu* of the Congress at Paris was the omission of the mortuary statistics of Bavaria, which had been communicated by M. Hermann, but inadvertently shelved by the *rapporteur*. We should have been glad to know the result of a service which, according to

[1] The English statistical nosology contains 110 causes of death, together with a supplementary table of less frequent diseases, almost as numerous, and all capable of inclusion in the ordinary tables.

M. Hermann, had then existed for twelve years in Bavaria. He declared that the English returns, as well as the methods and inquiries on which they were founded, were neither so exact nor so complete as those of his own State; yet he warned the Congress not to receive, without extreme caution and reserve, the results of any statistical investigations into the causes of mortality, seeing that in all countries great numbers die without medical attendance, and that, even where the physician is called in, the cause of death is not always ascertained.[1]

M. Hermann amused the assembly by exposing not only the scientific imperfections of the individual reports, but the hopelessness of any attempt at classification, thus:—

'Les Médecins eux-mêmes ne sont pas d'accord sur la manière de classer les maladies. Autant de pays, autant d'écoles. Que dis-je? dans le même pays, autant de facultés, autant d'avis opposés; j'oserais presque dire autant de médecins, autant de dissidents sur les bases d'un bon système de classification. Un médecin d'une grande réputation n'a pas hésité à nous dire, au Congrès de Bruxelles, qu'une classification uniforme pour tous les pays était tout simplement une utopie, l'accord entre les divers corps de l'Europe étant impossible.'

(7.) One is tempted to ask why Baron Haussmann, Prefect of the Department of the Seine, did not appear, either in person or by deputy, to explain and defend the nomenclature and classification adopted for Paris, if not for other principal cities of France? Neither M. Bertillon nor M. Parchappe said a word about it, though they rendered important assistance in the discussion, and though the system was then at work. We are not, however, without information on this point, for a bulky volume of 'Recherches Statisques sur la Ville de Paris,' the sixth and as yet the last of the series,

[1] The systems of mortuary registration and classification of the causes of death in operation in Prussia and Hanover, ten years ago, are noticed in 'A Defence,' &c., pp. 44, 45.

was published in 1860 by the Baron himself;[1] and it contains a tabular view of '*causes de décès*,' 1854-5-6. From this we learn that, of the 105,000 deaths reported in those three years, no fewer than 11,000 are classed under the comprehensive but unsatisfactory head '*autres causes*,' and only 324 as '*causes inconnues*.' All the cases, we may suppose, had been verified under the formal and minute, though really inefficient and complicated, system of mortuary inspection then in force throughout the French capital. These deaths are classified under some twenty divisions, one being a heterogeneous but imperfect group of developmental and violent deaths. The principle of classification somewhat resembles that of our old army and navy nosologies, beginning as they do with 'Fevers' and the contagious exanthems; but with so many classes there must be a proportionate liability to error in abstracting the returns, especially as most of the species are but indifferently defined, and many well-known diseases not even named, such, for instance, as gout, rheumatism, scurvy, starvation, alcoholism, and syphilis. Fancy the *morbus gallicus* absent in a Parisian nosology! Rigorous criticisms of these tables would, however, be unfair, for we may be sure that in the five years which have elapsed since their appearance, the suggestive reports of the International Congress have not been without effect upon so observant and energetic an administration as that of the French Empire.

§ X.—*The Results at Vienna.*

(1.) The resolutions adopted by the Parisian Congress—concerning medical reports and verification of the causes of death, and the employment of physicians in abstracting the facts recorded in mortuary certificates—were referred to the

[1] To Mr. Aspland, of Dukinfield, we owe a very interesting description of the French law and practice respecting mortuary registration. It was published by the Manchester Statistical Society in 1861.

next following Congress at Vienna, in 1857, together with the unsettled question, whether the authorized list of fatal diseases should be divided into zymotic, constitutional, and local (Farr), or into acute and chronic (Marc d'Espine).

The section on the Statistics of Mortality, presided over by a very able man, Dr. Helm, Medical Councillor and Director of the General Hospital at Vienna, after many lively discussions and a thorough sifting of the more involved topics in debate, decided, as at Paris, that it would be neither useful nor possible to divide the causes of death according to either the English or the Genevan scheme,—'*d'après la mode de leur apparition, ou d'après leur marche.*'

Hopeless diversity of opinion, together with a conviction of the uncertainty of any abstracting process in which the same malady was liable to be referred sometimes to one class or order, sometimes to another, determined the Section to adhere to ONE list of diseases, embracing the fifth and sixth classes of the previous session, and leaving the other five mainly as agreed on at Paris. No good reason appeared for maintaining a separate class for ill-defined 'causes.'

The medical authorities of Vienna made several changes in the order of the list, and a few in the nomenclature of maladies. Some of the names would hardly be approved of in England. Such as *Malum Pottii*, and *Morbus Brightii*, however complimentary to the country of their first description, ought to be discarded from any nomenclature of scientific pretensions. Dr. Farr still called for a classification, to be drawn up by Government authority, in the several States of Europe. One gentleman proposed to solve the difficulty by a simple alphabetical list.

(2.) The question of introducing names of diseases not ending fatally, so that a classification might be applied not only to deaths but also to sickness, was again brought forward by Dr. Farr, and was again decided in the negative.

The Section held that Government could only demand reports concerning the dead, that system and control were possible only in mortuary registration, that returns of sickness not terminating in death must always remain incomplete, and that inductions of sufficient importance to the sanitary condition of a people might be drawn from full reports of fatal maladies. We in England are prepared to join issue with them on all these grounds.

Rather than 'formulate classification for all possible cases,' the Section applied itself diligently to the preparation of forms of certificates (*bulletins*), which might give some security for the return of real facts. Without assenting to the number and minuteness of the particulars to be demanded in such 'bulletins,' many here would agree with the majority of that assembly, that the true character of disease, whether fatal or not, would be determined more surely by a sound system of certification than by any kind of statistical classification.

Three forms of 'bulletin' were prepared: (*a*) applying to the still-born and to deaths in the first week after birth; (*b*) to deaths from violence and accident; and (*c*) to deaths from disease, old age, and unknown causes. An excellent code of 'Instructions', accompanied these forms; and, if precision and completeness of system were sufficient to attain an end, there could be no doubt of the success of the scheme sanctioned by the Vienna Congress.

(3.) The most exciting part of the debate related to the action of Governments in the matter. The President and the Germans in general called for the establishment of a special department of medical statistics; others, as M. Legoyt, proposed that physicians should be attached to existing statistical departments for the purpose of abstracting the returns. Dr. Farr, as the result of his experience, assured the Congress that professional knowledge was not only advantageous but essential to the service; and that when two or

three causes of death are entered on one certificate, medical skill and judgment are required of the abstracting officer. He must have astonished the assembly by informing them that *one* physician attached to a central bureau was sufficient for the duty of abstracting all the causes of all the deaths in England—from three to four hundred thousand *per annum*.

(4.) The resolutions of the Congress are thus described in Dr. Farr's Report to the Registrar-General.

The Section decided :—

'(1.) That the cause of every death should be investigated, and that it should be returned by the medical attendant. In Austria the medical attendant is bound by law to return the cause of every death which has happened in his practice, and the body is inspected by a sanitary officer (Todtenbeschauer).

'(2.) Where no such officer exists, the Section laid it down that in the interests of sanitary police and of justice it should be ascertained through medical agency, if possible, whether death had actually occurred from natural causes or otherwise; and where the person deceased had not been attended by a medical man, the cause of death should be especially investigated by the sanitary inspector, or a person appointed for the purpose.

'(3.) That the several States should adopt the forms of certificate appended to the report.

'(4.) That the above measures would be illusory, unless in each State a special medical and statistical department were created for the classification, verification, and discussion of the facts in periodical reports.

'The three first decisions of the Section were adopted by the Congress; the fourth, at the suggestion of MM. Legoyt, Farr, and Stubenrauch, and after some remarks by MM. Hopf, Varrentrapp, and Helm, was modified. It assumed this form,—that the materials collected in each State should undergo revision by a medical officer specially appointed, and be by him arranged and discussed in reference to their bearings on statistics, medicine, and the public health.'

That the medical statist of England gained some important advantage at these sessions of the International Congress cannot be questioned. Beside leaving unmistakeable marks

of his own nomenclature impressed on their category of fatal diseases, he brought away some decided improvements and serviceable hints from foreign authorities.

§ XI.—*A Return Home by Edinburgh.*

(1.) No sooner are the continental discussions at rest or adjourned, than a host of British critics and objectors appear on the scene. The most persevering and systematic opponent of the present English classification is Dr. Stark, the head of the Scottish statistical department. His first paper on the subject, in 1860, is wholly controversial. His second contains a scheme of his own. Perhaps there could be no clearer evidence of error somewhere, than the existence of irreconcileable differences between the chief authorities in vital statistics in England and Scotland. Comparing the original nosology of the Registrar-General with the new classification, Dr. Stark much prefers the former, defending it on all points against the latter. He considers that, unless very strong proofs of the necessity for change were adduced, a principle of tabulation which had been in use for twenty years, and by which the (supposed) mortality of each group of diseases might be compared in different places and at different times, ought by no means to have been altered. 'An official statistical table ought to be a stereotype never to be departed from.' This dictum will hardly be received as an absolute axiom by any but those who look merely to the convenience of the classifier. Indeed, Dr. Stark's objections to the English system apply almost exclusively to the work of classification, and scarcely touch the nomenclature.

(2.) One principle to which I call particular attention, as illustrating the special difficulty of a 'statistical nosology,' has been strongly insisted on by the Edinburgh statist. He justly maintains that a 'scientific arrangement of DISEASES' is a totally different thing from a 'statistical classification of DEATHS.' The former is nosology; the latter a branch of

statistics. The primary disease and its cause are distinctive of a scientific nosology; but they are an excrescence on mere mortuary statistics, as was shown in the Paris Congress. Dr. Stark is therefore hardly consistent with himself when he proposes that in a *statistical classification* 'every death must, so far as practicable, be tabulated under the primary disease, and not under its secondary complications.' Such a regulation would do well enough for scientific nosology; but it would impair that sameness of kind which should distinguish every group of units in any statistical return. A record of deaths should deal only with acknowledged *facts*, and not with *opinions*, as it must do if circumstances, long antecedent to the fatal event, are to define and identify the nature of that event. For instance, when Dr. Stark proposes that all fatal dropsies, the causes of which had not been ascertained, are to appear under one head, 'uncertain seat,' and other deaths from dropsy, which have been traced to anterior organic diseases, are to be tabulated under various other orders, appropriated to local maladies, he violates his own principle, and distributes events of the same kind under different heads. The same criticism applies to his directions about fatal hæmorrhages, and other diseases of constitutional origin or uncertain seat. Another of Dr. Stark's principles, corollary to the preceding, is that every fatal disease must be tabulated, if possible, under the heading of that organ of the body which was primarily or chiefly affected; and here again occurs the same source of fallacy; for, if the final manifestations of disease are to be returned and abstracted for a statistical table of deaths, the history of the case need not be appealed to for the organ primarily touched. Besides, as the science of pathology advances, diseases may be almost said to change their seat. For there are many which have been long assigned to organs obviously and symptomatically concerned, but which, one by one, are being discovered to depend on some cachexia of the constitution, or disease of the

blood, or even to alteration of tissue in some distant organ or region of the body never before suspected. How long will diabetes be referred in every instance to the kidney, when it often depends on the brain?

Although Dr. Stark does not object to the term 'zymotic,' nor to its including epidemic, endemic, and contagious diseases, it is plain that the new zymotic class, with its four orders, is his *bête noir*; and most who have joined this discussion, especially distinguished medical officers in the public services, share his objections to certain insertions in this class. When metria and erysipelas are classed with miasmatic diseases, on account of their occasional mode of propagation, we call to mind that they are more often sporadic, and would therefore more naturally take their place among diseases of the structures which they respectively attack.

Rheumatism again is a constitutional affection; yet while Dr. Stark thinks it should be referred to 'organs of locomotion,' other pathologists, as Dr. Aitken, class it with its congener, gout, under diathetic diseases.

The parasitic and dietic orders of Dr. Farr's first class are vehemently opposed by Dr. Stark, who declares that deaths from alcoholism and ergotism and the like ought to be included with poisonings; that other names entered in the dietic order should be referred to the endemic, and some to the constitutional class. Parasites, as is well known, are often mere *results* of disease; and Dr. Stark would refer each entozoon and animalcule and vegetable growth to the organ or structure in which it bred or was found.

(3.) With respect to the English second class, Dr. Stark claims a restoration of the old name, 'diseases of uncertain seat,' to which he would refer many final symptoms or proximate causes of death, when the antecedent organic disease had not been ascertained. This is an approach to the safe principle of registering only the mode or manner of death.

There are certain alterations suggested in our third class,

'local diseases'; but I need only mention Dr. Stark's general objection to the 'developmental' class. He denies that the third and fourth orders, old age and atrophy, have any connection with the definition of the class. His most valid reason for excluding atrophy is, that if it be a disease of nutrition it ought to be included with dietic maladies. He also animadverts upon the want of a distinct class for 'sudden deaths—cause not ascertained.'

It might have been expected that, when called upon, Dr. Stark would not fail to suggest a classification of his own. Accordingly, in reply to a request of the Epidemiological Society, of which more will soon be said, he has furnished a scheme which differs *toto cœlo* from Dr. Farr's new system, and in some important respects also from the original 'statistical nosology' of Somerset House. In place of zymotic diseases he restores the old 'fever' class, adding the principal constituents of Cullen's order of *Exanthemata*. It is, however, no improvement upon either Cullen or Farr to separate small-pox, measles, scarlatina, and diphtheria from erysipelas, noma, and carbuncle. The following eight classes, containing diseases of certain organs and regions of the body, correspond in name with the eight orders of our 'local' class; but the items are much more numerous; one of Dr. Stark's main principles being to refer every disease that can claim a local habitation to the organ which it generally attacks. His tenth class is mainly identical with the 'diseases of uncertain seat' in the first statistical nosology. Then follow, as separate classes, malformations, debility at birth and premature birth, old age, sudden deaths, and lastly, we have a large class of 'violent or unnatural deaths,' also nearly corresponding with the old seventeenth class of the Registrar-General.

These changes rather furnish objections to classification of any kind than supply the demand for a simple and unobjec-

tionable list of the causes of death. It is the insatiable craving for a nosology that frustrates all endeavours to compile a useful form of mortuary returns.

§ XII.—*What the Public Services say.*

(1.) A very interesting and valuable collection of opinions on this subject was recently published by the Epidemiological Society. Two years ago Dr. Farr, apparently dissatisfied with his own reformed system, or perhaps desirous of averting, by wise and generous concessions, the hostility which that system had encountered in other departments of the public service, submitted to the Council of the Epidemiological Society the following questions :—

'1. Is there a definite group of diseases which can be separately studied in their epidemic form, &c. ?

'2. Is it desirable to classify them together in statistical returns either of causes of death, or of forms of sickness, &c. ?

'3. Do you think that the classification which has been in operation for many years, and is now in operation in the returns of the Registrar-General, should be altered at the present time, and if so, what would you substitute for it ? '

The Epidemiological Council adopted the judicious course of circulating these questions, with a few explanatory observations, among members of the society, and a few others who might be presumed to have given attention to the subject. After showing that Dr. Farr's miasmatic order includes the diseases enumerated in the following quotation, they proceed :

'In other classifications, after grouping together all forms of fever, the diseases are arranged mainly according to the part or organ of the body chiefly affected. Thus cholera, diarrhœa, and dysentery stand among diseases of the intestines ; diphtheria, cynanche, and catarrh among diseases of the respiratory organs ; erysipelas and carbuncle among those of the integumentary organs, &c. This plan is that which was adopted in the Army Medical Department until within the last three years, when it

was replaced by the classification of the Registrar-General, and it is still followed in the returns of the Medical Department of the Navy. . . . . As there is still considerable difference of opinion in the profession as to the most convenient and useful system of classification for the purposes of hygienic inquiries, statistics of diseases, &c., the Council will feel greatly obliged if you will favour them with your views on the subject which Dr. Farr has brought under their consideration.'

Among the respondents to this circular were the heads of several departments of the public medical services, and other distinguished members of the profession; and in publishing the replies of those gentlemen, the Council state that,—

'Considering the sentiments expressed by the principal officers of the Medical Department of the Army and Navy, and by other eminent members of the profession, and considering also the inconvenience of employing different systems of classification for the registration of deaths in the three great divisions of the kingdom, as well as in some of our colonies, it is very desirable that the attention of the Government should be directed to the subject, in order that steps may be taken for its further investigation, in relation to the recording and tabulating diseases in the public services, and to the registration of the causes of death throughout the empire.'

The attention of the Epidemiological Council is almost confined to the classification of diseases, and particularly to the miasmatic order. Their doubts and queries are all nosological, and touch mortuary registration only incidentally.

The President of the College of Physicians declined to offer any opinion, pending an inquiry by a committee of his college on the very subject of the circular. The Regius Professor of Medicine at Oxford, the Director-General of the Army Medical Department, and Dr. Babington, also deemed it desirable to wait for the conclusion of that inquiry. Dr. Logan and Dr. Balfour, the heads respectively of the sanitary and statistical branches of the Army Medical Department, disapproved (the latter most strongly) of the classification of the Registrar-General, as being inapplicable to the returns

of their services. Dr. Bryson, Director-General of the Navy Medical Department, and Dr. Nisbet, Inspector-General of Fleets and Hospitals, are no less decided in their objections, and still more urgent in their demand for immediate alterations in the system proposed to be extended to the Navy. Dr. Stark's objections have been already noticed. Sir W. Wilde for Ireland, and Dr. Morehead for India, also propose distinct schemes of classification; the former mainly in accord with Dr. Farr's nosology, the latter in marked contrast with it, although both are adapted to a registration of disease, and quite unsuitable for a record of deaths. Dr. Dickson, Medical Inspector of H.M. Customs; Dr. Parkes, Professor of Military Hygiene in the Army Medical School; Dr. Laycock, Professor of Medicine at Edinburgh;[1] and Dr. Gairdner, Professor of Medicine at Glasgow, while generally supporting the Somerset House classification, recommend some important improvements.

Surely with such an array of opponents, and with so small a muster of hesitating friends, Dr. Farr cannot wonder at our joining the Epidemiological Society in calling for a reconsideration of this question. A few general deductions may be drawn from the replies published by that society.

(*a.*) The chiefs of the War Medical Departments evidently

[1] In noticing so many systems of classification, I ought not to omit a reference to Dr. Laycock's remarkable and 'carefully constructed nosologies,' contained in his *Principles and Methods of Medical Observation and Research.* His erudite and exhaustive method of treating the subject can be understood and appreciated only by those who study his work, which well repays a careful examination. To the medical student it is of great value, leading him to reflect on the physiological, ætiological, and pathological grounds on which all diseases may be differentiated, compared, and grouped. But it is utterly unfit for mortuary statistics. Two instances of its inapplicability to returns of causes of death may be mentioned. Rheumatism and gout, in their various forms, are entered under two chief classes of his Nosology;—namely, under Fevers (I) and Constitutional Diseases (II). So, again, Trichinia appears under Class I, *Epizootic* Fevers, as well as under Class II, *Parasitic* Constitutional Diseases.

treat the discussion as though it bore only upon the returns of sickness, and related to mortality merely as one of the results of the maladies reported. Their several suggestions, therefore, although extremely serviceable towards the preparation of a scheme for registering diseases, do not in general tend to supply the other desideratum, a good statistical classification of deaths. The prevalence of sickness of various kinds, and the influence of each kind upon the effective strength of the men under their care, does not necessarily imply a proportionate prevalence of mortality.

(*b.*) The objections of these authorities apply almost exclusively to the classification under debate, and do not regard nomenclature. It is Class I. mainly which rouses their opposition. Dr. Gibson, Dr. Balfour, the late Sir Alexander Tulloch, Dr. Dickson, and to some extent Dr. Gairdner, consider that the terms zymotic, miasmatic, epidemic, endemic, and contagious cannot be safely applied to any groups of maladies, without reference to geographical considerations, of which little is known at present. Dr. Balfour shows that the zymotic class would contain a different list of maladies in each of our colonial dependencies, and that,—

'If it be applied to all diseases which may be endemic, epidemic, or contagious at any time, or in any part of the world, the list at present published would require to be enormously extended, and would in fact abolish a classification altogether, for it would include at least nine-tenths of all existing diseases. If it be proposed to avoid this difficulty by including in the class only such cases as are, at the time and place of observation, believed to be of endemic, epidemic, or contagious origin, these diseases would be reported from one station as zymotic, and from another as belonging to the class of sporadic local diseases.'

In fact, these terms involve theories of origin and propagation which are still far from being established with respect to the majority of the diseases included in this class. Dr. Gairdner, among other judicious observations, says:—

'What are epidemic diseases? What endemic? What con-

tagious? Round each of these expressions controversies are circulating, which will probably never come altogether to an end. By fusing the three expressions into the designation of one class, you greatly diminish the value of your results, but you do not eliminate from them the controversial element.'

The difficulty arising from the topographical distribution and modification of disease is strongly pressed upon our consideration by these replies. It has long been known that diseases, essentially the same, present themselves in different aspects, according to the localities in which they prevail. If characteristics, which may vary, are made the basis of a universal classification, the same sort of illness may have to be entered under a different statistical heading in one country or district from that to which it is referred in another. This consideration applies most forcibly to the foreign stations of our world-wide empire, but in a minor degree also to different counties in the British Isles. One territory may be distinguished from another by its nosology, as well as by its fauna and flora. Soil, elevation, climate, density of population, civilization and education, confer certain peculiarities upon the sickness, as upon the physical and mental constitution, of a people. The same so-called zymotic disease—say, ague or remittent fever—may very properly be returned as epidemic in a dirty, ill-fed village, endemic in a fenny district, and sporadic in a well-managed town. Ophthalmia and dysentery are mentioned among many other diseases which appear in various relations to the people of different districts.

(*c.*) The heads of public departments generally demand the statistics of separate maladies rather than of artificial classes of disease. The medical authorities of the army have found it necessary to break up the zymotic class, and even its miasmatic order, into smaller groups. Dr. Bryson said:—

'The death-rate from specific diseases it is always desirable to ascertain, but it is not possible to educe any sound or useful

information from the death-rate of a group or class of diseases arising from different and possibly dissimilar causes.'

So Dr. Parkes:—

'The statement of the amount of the zymotic or miasmatic class of diseases among a community gives some very imperfect information. It tells us very little, and that only in very general terms, of the morbific conditions among such a community. But if instead of such a general term we state the proportion of the individual diseases, what a light is at once thrown on causes, and the requisite mode of prevention!'

Great questions of causation and prevention concern rather the prevalence of single diseases than the death-rates of composite classes and orders. Correctly to name and identify each serious illness is of far greater importance to public and preventive medicine than to calculate the number of cases in a large ill-defined group, the items of which may change according to time, place, and opinion.

I may here again quote Dr. Parkes, who concludes,—

'that for the purpose of prevention, and for tracing causes, *individual identification* and announcement is necessary, and that the mere statement of a group formed by a general classifying character is of very subordinate importance.'

All this has to do chiefly with the registration of sickness, to which, as a necessary complement to a record of the causes of deaths, we are thus again brought round. In such an extension of our Registration Department, a scientific nosology would become of the highest utility, and, with some important modifications, we could not possess a better than that which Dr. Farr has, with so much labour and skill, compiled for this country. And in my opinion, the nomenclature, if we put aside the classification, should follow the progress of pathological science, and not appear as a 'crystallized' form of obsolete error for the convenience of official abstractors and statists.

§ XIII.—*Statistical Congress in London*, 1860.

(1.) This seems to be the place to comment briefly on some remarks and propositions made at the Fourth International Statistical Congress, concerning the registration and classification of diseases; having already noticed the proceedings at Brussels, Paris, and Vienna. (§§ IX. X.)

The previous differences of opinion, and the variety of administrative suggestions on this question, culminated in more definite conclusions at the London Congress, though without settling the controversy.

And, first, it is to be observed that some of the best authorities there present were the most decisive in depreciating the value of general death-rates as true indicators of the degree of public healthiness. Notwithstanding Mr. Edwin Chadwick's repeated attempt to force the rate of mortality (local or hospital) and its variations, as conclusive evidence of the success or the failure of sanitary measures, the drift of the discussion rather showed that returns of sickness, especially in hospitals and dispensaries in the public services and among the industrial masses, would constitute a far more reliable and accurate test of sanitary conditions.

(2.) The greater part of Miss Nightingale's admirable work at that Congress related rather to the record of disease than to that of mortality. The following statement of Dr. Ballard, one of our most able and experienced medical inspectors, is much to the point. (Report, p. 287.)

'Speaking in regard to science in general, I wish to make the remark that the mortality returns which are given by our General Register Office, and which are to be obtained from the registers kept by other Governments, furnish no clear, no thoroughly satisfactory indication of the prevalence of disease at various periods, as affecting numbers of the population. It depends in fact on the fatality of different diseases, which varies very considerably.'

Mr. Ernest Hart brought forward the proposition of

Sickness Returns—in connection with Dr. Farr's General Scheme of Sanitary Statistics—in these terms (p. 286, *ibid.*)

'We must all acknowledge that the returns of epidemics, which are only based on mortality returns, must be imperfect, and that to have any scientific value they should be based on sickness returns. The difficulty . . . . lies in the fact that (for the whole population) no sickness returns at present exist. Two questions of course suggest themselves in connection with any such returns; the first is, their expediency; the second, their practicability. . . . . Now, as to the expediency of our obtaining these returns there can be very little doubt. Every one will admit, without requiring any argument on the point, . . . that to obtain returns of sickness would be to obtain information on a number of facts as to which now we have no information. We know, for instance, that if we had returns of sickness, we should have the first notice or warning as to diarrhœa, which forewarns us of the coming of cholera, and so of sore throat, which would warn us as to diphtheria. Then as to practicability; that is set at rest at once by saying that such returns can be made, for they are now on the table. [Weekly Returns of Metropolitan Officers of Health.] Their value is not only very great, but progressive, depending on the voluntary efforts of medical officers. They *were* imperfect, but they have gradually become more perfect. The whole of the returns made at the commencement by the officers of health included only a few thousand cases; but the last series of returns included several hundred thousands. But the moment they attained their highest efficiency and value, it was found that Government funds were wanting for the purpose. I submit that Government subvention is as much needed for sickness returns as for mortality returns. . . . It is exceedingly desirable that they should be obtained universally, and I propose that the Section affirm this principle.'[1]

Dr. Tripe, also, one of the Metropolitan Officers of Health, in confirming Mr. Hart's account of that most creditable effort, stated that the health officers found the publication of the sickness returns of the greatest possible aid to themselves and others engaged in sanitary work, giving them the earliest

[1] A more complete account of this effort and its failure is given at page 92 of these essays.

possible notice of the existence of epidemic diseases. The returns were made at their own expense. They even paid a clerk for editing them, and the work was done under the supervision of Dr. Thomson and himself. But the Government would not even go to the small expense of printing and circulating them!

After the evidence given at that Congress as to the superior value of correct sickness returns, one can no longer admit that the sanitary condition of any population or locality can be fairly estimated by its mere general death-rate.

(3.) A matter of earnest debate at the London Congress was the name of the disease to be entered for each case on the register. In the hospital statistical form proposed by Miss Nightingale, the nomenclature is taken from that of the Registrar-General. But the reasonable and almost universal demand for the registration of secondary as well as of primary diseases—of the various developed as well as of the original ailments—showed clearly the absolute necessity of independent returns of sickness. For of course the number of injuries and diseases suffered in succession by the same patients far exceeds the actual number of the persons affected; and the different 'cases' in the same individual generally belong to different classes of the official nosology; so that it is evident that 'the cause of death' in each fatal case ought to be registered separately from the names of disease entered in the returns of sickness. The curious instances of perplexity adduced by various able speakers prove incontestably the absurdity of attempting to identify the name of the primary disease with that of the 'cause of death,' as they also plainly indicate the necessity of local records which shall enable the student of sanitary statistics to trace each sufferer through the Disease Register, under perhaps a number of entries, to his final place in the Death Register.

(4.) The additions to Miss Nightingale's scheme made by

the Congress, though considered by that excellent lady to be of minor importance, were, in the opinion of the majority, absolutely essential to correct conclusions, not only as to the construction and management of each institution, but also as to the causes of sickness, and the comparative extent to which seasons and meteorological changes, localities and soils, classes and occupations, social habits and conditions, are responsible for such causation.

A valuable addition was also made by the late Sir James Clark, to the effect that the previous ailments of the patients, as also the diseases and habits of their parents, should be recorded, thus bringing out great facts concerning the hereditary descent and transmission of disease.

It was made clear that no uniform system of sanitary statistics, not even the valuable categories laid before the Congress by Dr. Sutherland and Dr. Farr, could lead to conclusive results, without the element of sickness, in addition to that of mortality, which alone they proposed.

(5.) Again and again was the Congress inevitably drawn into the vexed question of nosological classification.

The divergence of view between the medical chiefs of the War Services and Dr. Farr was amusingly brought out on several occasions. Although Dr. Bryson and the Navy Medical Board, under its present distinguished chief, Sir Alexander Armstrong, have maintained to this day a nomenclature and classification differing in important particulars from that in general use for the civil mortality as well as for the Army, and founded mainly on the former official nosology, it was obvious that the Army Medical Board had yielded only to Government pressure on this point. Dr. Balfour, who compiled the Report of the Fifth Section, in supporting his well-known objections to that classification, admitted that the Army medical authorities had adopted it, by direction of the War Minister, Mr. Sidney Herbert (afterwards Lord

Herbert of Lea), 'upon the express recommendation of Dr. Farr, and in opposition to the opinion of Dr. Balfour.'[1] It was a State victory over professional opinion.

(6.) One should perhaps notice Miss Nightingale's defence of a classification, namely, 'that a nomenclature without it would involve the use of tables of unmanageable dimensions, and she therefore proposed that the classification which is now familiarly known in this country through the Registrar-General's reports, and which has been adopted in America, should be used in hospitals, an arrangement by which her forms have been reduced to one-half.'[2]

It may suffice to observe that her experience has been said not to coincide in result with that of some other collectors of hospital statistics, who have admitted only the *names* of diseases on compendious forms. But allowing full force to the principle of brevity which Miss Nightingale wishes to establish, it becomes a fair question for consideration whether any diminution in the size of the return, which could be effected only by reducing the number of its elements, is to be justified when such reduction involves the grouping under a single figure diseases which, in the interests of science, and to prevent erroneous ætiological conclusions, ought to be returned separately.

(7.) Whether time and use may not remove the many objections which have been made to the Registrar-General's classification, I do not presume to say; but when a practical man like Dr. Tripe (p. 251, *ibid.*) adduces valid reasons against the official grouping, and cites notorious instances of error arising from it, I may be excused for asking that a more explicit, even if a less compendious, form should be adopted. Dr. Tripe, as an experienced health officer, also exposes the difficulty of selecting out of three or four diseases

[1] General meeting. Report, p. 143.

[2] See Dr. McWilliam's Report of the Second Section, p. 173.

specified in the certificate, *one* to be returned and classified as *the* cause of death.[1]

To return to the scientific question, I proceed to notice—

§ XIV.—*Some of the practical Difficulties of our Certifiers and Abstractors.*

(1.) Even were the scientific reporter of the 'cause of death' always able to have observed from first to last the successive forms of disease, which in long illnesses bring the healthy living organism to a decomposing corpse, he would often be quite unable to describe explicitly the whole series of morbid changes within the space allowed by authority; 'the column in the register book in which it is to be inserted being not more than sufficient for the insertion of about ten words of moderate length.'[2]

He who sees only the end of the case, however skilled in diagnosis or versed in pathological inquiry, cannot always venture to certify, on vague report or even shrewd suspicion, the primary cause, *e.g.* fever or rheumatism, or the secondary cause, *e.g.* change of structure in some organ, when he has positive evidence only of the tertiary or last stage, *e.g.* the dropsy, or abscess, or hæmorrhage, or mortification, which was the proximate cause of death. The medical attendants of the poor rarely have the opportunity of watching a case from its beginning to its fatal end.

(2.) In any statistical analysis of deaths based on certified causes, only one cause can be assigned to each event; and, even if a nomenclature of disease were finally agreed upon, in a large class of cases insuperable difficulties must arise

[1] The following Registration puzzle is reported by a medical officer of Health in Gloucestershire—1874.

Copy of a medical certificate as to cause of death,—male, æt. 74.

'*Causes of Death.*—(1) Alcoholism, (2) Fracture of Jaw, (3) Bronchitis, (4) Morbus Brightii, (5) Inguinal Hernia, (6) Cerebral Hæmorrhage.'

'*Duration of Disease.*—(*a*) Two months and 14 days, (*b*) Two days.'

[2] Reg. Gen. Stat. Nos., 1845.

in selecting that phase or stage of morbid action, that particular vital or structural change, which is to be formally returned as the cause of death. Among a number of reporters of various degrees of capacity and information, or belonging to various schools of pathology, though all may be legally qualified medical practitioners, there can be no possible guarantee that all shall adopt the same principle of selection.[1]

This difficulty, as it is felt by the certifier, has been recognized by the Registrar-General in the printed form of medical certificate, where he calls for a report of both first and second causes. This demand for two or more successive causes is founded on the assumption—groundless in most instances—that the various links in the chain of causation have been observed by the same person—the mortuary certifier.

The difficulty, as experienced by the abstractor, was acknowledged by Dr. Farr, when he suggested at the Paris Congress 'a secondary analysis of causes of death,' apparently with the object of obtaining separate statistics of secondary or final maladies. This further analysis of the returns would doubtless lead to some attempt at classifying secondary or tertiary 'causes,' and one can readily conceive that to each step in the succession of morbid phenomena statistical calculation might be advantageously applied. At all events, the last of the series might always be thus treated, and then we should be supplied with a great desideratum, complete and perhaps classified returns of the immediate causes or modes of death.

(3.) We must also recollect that the mere name of many a lesion, or structural change, or combination of symptoms,

[1] 'Experience enables me to say that medical men, in giving the customary certificate as to the cause of death, sometimes give the primary malady and sometimes the secondary; at times, however, both were named.'—Dr. Noble (of Manchester) *On Fluctuations in the Death Register.*

is yet under debate. Happily for a variety of tastes, there is abundant choice of synonyms; but some of these may be 'sadly defective both in precision and fulness' (*Laycock*); and the plurality of names affords little comfort to the nosological statist, who endeavours, often in vain, to identify each item in his category. This source of perplexity exists even in hospitals. Dr. Stone, the registrar of St. Thomas's, stated with respect to the out-patients, that the name of a disease 'is given differently by five or six different medical officers, who see the patient on different mornings. . . . . The statements so vary, that it would be quite useless for any person to attempt to make a register from them.'[1]

The importance of a clear, simple, and precise nomenclature in this matter is inestimable; first, to the certifier, and afterwards to the classifier or abstractor of returns;[2] for single causes rightly named, whether maladies, or injuries, or physiological changes, may now be classed or redistributed according to the objects or opinions of any abstractor.

(4.) But the difficulty does not consist only in the succession of causes; it may depend also on the concurrence of several. What then is the medical certifier to do with several contemporaneous causes. The Registrar-General tells us:—

'When three or four causes have concurred in producing death, it will generally be sufficient to write them under each other without connecting verbs or particles.' (Stat. Nos. 1845, p. 11.)

The last suggestion is made, perhaps, with the view of

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[1] Report of Statistical Congress, 4th Session. London, p. 257.

[2] 'Si le médecin chargé d'indiquer la maladie qui a causé un décès n'en trouvait pas la designation dans la nomenclature, il risquerait ou de rapporter le cas à une espèce qui lui est étrangère, ou de lui donner une dénomination qui ne se trouve pas dans la nomenclature adoptée. Il en résulterait, pour le *statisticien* chargé du dépouillement des documents mortuaires, une grande incertitude, et, en outre, une grande difficulté pour ramener des désignations empruntées à des habitudes pratiques et à des écoles très-diverses, à un type homogène.—M. Marc d'Espine, *Congrès International de Statistique à Paris*, p. 344.

bringing any statement of the complex problem within the prescribed 'ten words.' One may be excused for inquiring whether the attempt to crowd into the certificate of the immediate cause of death more than it need contain can serve any really useful purpose.

§ XV.—*Other Instances of these Perplexities.*

(1.) The malady called dropsy appears in the new *Statistical Nosology* under Class II. Constitutional.

When fatal, it almost invariably results from morbid change in some internal organ; and if the certifier, knowing the history of the case, cannot conscientiously put an effect for a cause, he probably returns, as primary, some disease of heart, or lungs, or liver, or kidney, as the case may be; and then the abstractor of returns probably enters the item under the proper order of Class III. Local. But this organic change is very often secondary to some kind of fever,[1] and then, to be exact, the primary 'cause' should be entered under Class I. Zymotic. Now, suppose the certifier escapes the dilemma by entering the several causes in their proper order, what is the classifier of returns to do with the case?

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[1] Professor Stokes, in his admirable address at the Leamington Congress, adverting to the difficulties which attend medical statistics in general, and the statistics of pneumonia in particular, said: 'If we look at the diagnosis of this disease in a purely physical point of view, we run the risk of committing the great error of confounding cases the constitutional nature of which is widely different—cases on the one hand of original idiopathic pneumonia occurring from accidental causes, and cases in which the change in the lung is secondary to some form of fever. And this makes a most important difference. It is my conviction that many of the so-called cases of pneumonia which have occurred in the United Kingdom since 1830 were really examples of the latter form. But, further, it is certain that in many instances the occurrence of the pneumonia is attended with such a change in the constitutional symptoms as to deceive the practitioner, and hide from him the fact that he had to deal with a secondary in place of a primary affection.'

(2.) Some one dies of mortification. This cause of death is to be returned under Class II. Constitutional. But (*a*) this particular case may be the result of frost-bite, which appears under Order 1, Chemical lesions, of Class V. Violent deaths; or (*b*) it may arise from ossification of the heart or arteries, and would therefore be properly referred to Order 2, Organs of circulation, Class III. Local; or (*c*) it may follow bed-sore, a frequent occurrence in prolonged illness or infirmity of whatever class, especially of that called developmental (IV.); or (*d*) it may supervene on violence or accidental injury, Class V.; or (*e*) it may proceed from any local inflammation (phlegmon), Class III.

In this case, the same immediate cause of death might be referred, at fancy or discretion, to at least five different heads of the Somerset House nosology.

(3.) Again, apoplexy is entered under Class III. Local, Order 1, nervous system. A man drops, becomes comatose, and dies. Is the death to be certified as caused by (*a*) the final apoplexy; or (*b*) the fibrinous plug (*embolus*) brought by the current of blood from the heart (Class III. Order 2) into an artery of the brain, causing the sudden loss of sensation and motion (*coma*); or (*c*) the preceding internal inflammation of the heart (*endocarditis*), and the consequent morbid growths on its valves, which caused the embolus; or (*d*) the yet anterior rheumatism or fever (Class I. Order 1) which produced the aforesaid cardiac disease. Is the fatal result to be classified under the first, or second, or third of these 'causes,' or the *coup de grace?*

(4.) Once more. A life is cut short by an epileptic fit. There is no question as to the fact, can there be any as to the cause? Yes, for that particular seizure might not have occurred had not the blood circulating in the brain of the deceased been poisoned by urea; nor might that poison have entered the blood but for antecedent disease of the

kidney; nor might the kidney have been so dangerously altered in structure had not constitutional gout been repelled, or had not acute dropsy been caused by a yet anterior attack of scarlatina. Here, again, is work for the speculative recorder of the cause of death. He might have at least four classes and orders to choose from.

In any one of the foregoing instances, could the death have happened from any one of the consecutive diseases *without its antecedent?* Or, on the other hand, would any one of the antecedents have inevitably led to its consequent? Might not the next cause have been averted by care, or by change of circumstances, and, if so, could the death be fairly attributed to the primary or earlier stages of disease?

§ XVI.—*Can the Difficulties be solved and the Errors corrected at a Central Bureau?*

The more cautious and truth-seeking the medical certifier, the more serious does he feel to be the responsibility of determining and reporting the predominant cause,[1] while the mere routinist will go through the business in a minute or two with the most cheerful indifference as to the effect of his act upon the national returns. Yet is it too much to say that the greater number of certificates *must* be given in this way?

But the difficulties of the most scrupulous certifier cannot equal those of the abstractor of returns. The former requires only a good nomenclature; he wants no assistance (!) from a

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[1] 'The terms *remote, predisposing, exciting, proximate,* applied to causes, imply an order of events in time. Practically, causes and effects are never single in medicine; there are in every case more series of changes going on than one; it is the combination of the whole into a unity which constitutes the disease. Hence the cautious medical practitioner examines carefully for several causes or "con-causes," when inquiring into a case. In naming, however, he selects those which are predominant.'—*Laycock on Medical Observation and Research*, 1864, p. 230.

'classification.' With clear and accurate definitions at his command, and with ordinary diagnostic skill, if he knows the history of the case, he can with tolerable certainty fix on one or more of the causes.

The embarrassments of the classifier, however, must increase in something like geometrical proportion, if not to the number of certifiers, certainly to the number of classes and orders in his statistical nosology. For suppose all causes —successive or concurrent—fully reported, we are not informed on what principles or by what machinery one of those reported causes is selected for each particular event, and published as *the* cause, in the national abstracts. There being no skilled *local* agency appointed for the purpose, the process must be effected wholly at Somerset House.

At Vienna Dr. Farr referred to the fact that one physician could analyse the returns and abstract the causes of some 400,000 deaths yearly. But we may venture to ask how this can be managed. Allowing that one-third of the total number, including coroners' returns and mere facts of death, require no great technical knowledge for their analysis, there must still remain a weekly average of 5,000 or 6,000 deaths, the reports of which have to be examined, and their alleged causes analysed and distributed among the numerous divisions of a scientific classification. The task would seem to be herculean, especially as it must be performed under the enormous disadvantage of distance and isolation from the certifiers. Explanation or correction may now and then be desirable, but no personal communication between the original reporter and the abstractor is possible. Under such a system, the maximum limit of error is incalculable.

The absolute dependence of the organization upon a central bureau is a very serious consideration. A change of ætiological opinions at Somerset House might lead to material variations in the average number of deaths returned under

different heads;[1] and some sources of fallacy in the present system of classification deserve notice in this place.

The attempt to eliminate from Class III. Local, those organic diseases which result as secondaries from constitutional or miasmatic primaries, leads inevitably to error and confusion. For instance, deaths from phthisis are often and not improperly certified as caused by its consequences, *e.g.* bronchitis, pneumothorax, empyema, ulceration of larynx, &c. Yet these deaths are to be classed under 'tubercular' diseases; and, on that system, pulmonary phthisis escapes recognition as a disease of the respiratory organs; while, between certifier and classifier, the total number of deaths from this destructive malady does not appear in the Blue Books.

Doubtless there would be some advantage in a complete return of deaths from any or all constitutional causes; but, were this practicable, I question whether it would compensate for the error inseparable from it,—namely, an understatement of the deaths resulting more immediately from particular organic changes. A diathesis is not a disease, still less is it, properly speaking, a cause of death; although it may be, and often is, concealed under the heading of some organ or region of the body, on which the constitutional evil has spent its violence. On the other hand, diseases of organs may, and often do, escape notice under certificates of final results, as dropsy, abscess, mortification, hæmorrhages, convulsions, &c.

These sources of error are not adduced as evidence against

[1] Dr. Tripe, one of the medical officers of health in the metropolis, when urging, at the London Congress, the great importance of uniformity of principle, both in returning and abstracting causes, answered for himself and his colleagues that, in making up the returns, they take the disease which caused the death (*i.e.* the immediate cause), and not the primary disease. When several causes are alleged for one death, to which, he asks, does the Registrar-General's Department refer the death? 'I know,' he adds, 'that in several instances the wrong disease has been taken.'

statistical returns either of primary or secondary diseases or of immediate causes of death. Quite the reverse. But they show strongly the necessity for a distinct registration of sickness and a separate statistical record of the modes of death.

Here we are led on to an important and in some respects a final question,—one which lies at the foundation of any plan of reform or extension.

§ XVII.—*What is the principal object of Certifying and Registering the Causes of Death?*

(1.) Is it to determine the cause of the first departure from health—the origin of the structural changes which have ended in death? Were this possible, which it is not under present arrangements, it would give no distinct information as to the immediate cause of death.

Is it to name and classify, with scientific accuracy, the primary, secondary, tertiary, &c., maladies, where the total sickness has been of long duration? This is almost equally impossible under the circumstances in which the majority of certificates are now granted. In order to carry into effect such a design, we need, as before said, a registration of diseases.

Is it not rather to determine simply and faithfully the nature of the event which puts an end to life—that is to say, the immediate or proximate cause of death? For this we require no nosology. The mere fact, be it hæmorrhage, or asphyxia, or debility (asthenia), or suffocation (apnœa), or apoplexy (coma), or any other final phenomenon of disease, might be defined clearly, recorded briefly, and verified officially. In such a record, all surgical cases terminating fatally in a short time and not followed by secondary diseases; all deaths directly caused by poison or violence, and all sudden deaths (causes not ascertained) would naturally take their place by single entry. Here also might be returned as causes of death—under separate heads, if preferred

—each of the shorter and more destructive diseases, such as malignant epidemics, cholera, plague, yellow fever, and other pestilences, in all which the rapid succession of morbid changes confers a notable unity on the cases. Physiological causes of death, as birth and extreme age, would be recorded with the same brevity and simplicity.

To such a register, whether classified or alphabetical, statistical calculation would be strictly applicable, for it would have to do with little more than modes of death, though both care and skill would be required in distinguishing accurately and naming correctly these immediate causes.

(2.) But if there is to be no divorce between the registration of deaths and the classification of diseases; if the two are to remain bound together by red tape in one unhappy *mésalliance*—a source of endless quarrel and hopeless disappointment—it were surely better to return to the simple alphabetical arrangement of the old Bills of Mortality. Indeed, there is much to be said for such a list.

A classification of fatal diseases has many points of analogy with a classified catalogue of books. Whoever wishes to consult a library catalogue ought to know the title of the book he is searching for. He has no right to expect a bibliographical record of all works relating more or less closely to his particular subject. So if anyone desires to ascertain the prevalence, in time or place, of any mortal sickness, he ought to know its proper name and definition. Many books, as well as many maladies, are so composite in their character as to render their allocation under single species or genera a matter less of science than of taste or fancy. Maitland and Panizzi proved some years ago to the House of Lords that, for cataloguing libraries, all plans of classification were open to serious objections; that no one principle of grouping subjects would satisfy all literary tastes

or meet all illiterate requirements; and that public libraries —that of the British Museum in particular—had better be catalogued alphabetically. The event has confirmed the wisdom of these conclusions. Perhaps we may in time arrive at a similar result in the matter of published records of diseases and causes of death.

§ XVIII.—*Some Medico-legal Evidence on the subject.*

The country is much indebted to two metropolitan officers of health for their vigorous exposition of defects and abuses in the present method of ascertaining and returning the causes of deaths.

Dr. Buchanan has devoted a section to the subject in each of his annual reports. In 1862 he stated that forty-five deaths were registered in St. Giles's, and the corpse in each case interred, about which there certainly ought to have been a proper inquiry; that in thirty-six of these there was no medical certificate, and in eleven no medical attendant in the fatal illness. He also gave examples of the unsatisfactory nature of the entries made in some of the uncertified cases, on the mere report of relations or neighbours; and, in some certified cases, he pointed out how entirely without meaning or purpose were the statements of the medical certifiers. He added:—

'It is intolerable in a civilized country, parading its respect for human life, that persons dying in this way should be interred without any scruple or inquiry. In at least two of the cases there is *primâ facie* ground for suspecting poison. Again, there were no fewer than twenty infants, under a week old, whose deaths were registered in 1862 as occurring from "premature birth," "convulsions," and so forth, without a particle of medical evidence of the cause.'

Then as to another class of deaths, where the deceased persons might indeed have been seen by a medical practitioner, but where further investigation was not the less

urgently required, Dr. Buchanan informed us that nine persons in his district were certified (in 1862) to have died of an 'unknown' cause, eight of them in the workhouse; the object of the surgeon who certified being, probably in all instances, that further inquiry should be made.

Still more important, if possible, is the evidence of (the late lamented) Dr. Lankester, who brought the additional weight of his experience as Coroner to bear on the question. In his interesting account of '*A London Coroner's Work for One Year*, 1862-3'—the first of the kind ever published—he said:—

'A large number of cases returned to the Registrar-General where medical certificates have been given, and registration with burial has taken place, have been highly unsatisfactory. Not only were such unsatisfactory certificates accepted, but medical certificates were registered (in cases) where the medical man had not seen the persons alive; and in some cases where they had neither seen them alive or dead. It has come to my knowledge that the registration of death has taken place in cases of violent death and sudden death without any appeal to the coroner of the district. It is very evident that such a system is fraught with danger to the public, and that it ought not to be left to the judgment of the registrar as to whether the coroner should be informed of the entire absence or irregularity of a medical certificate. It would at least be a thing easy of accomplishment in the London districts to require that incomplete or irregular certificates be sent to the coroner before registration.'

Dr. Buchanan has advocated the same measure; and on the motion of these energetic reformers, the subject has been taken up by the Metropolitan Association of Health Officers, and at their instance Government has been memorialized on the defective state of mortuary registration.[1]

[1] Dr. Lankester enlarged on this subject in a very interesting and suggestive paper read before the Metropolitan Association of Health Officers in May, 1863:—'On some Points of Relation between the Office of Coroner and that of Medical Officer of Health.' He remarked that, as the law now stood, the registration of disease was no preventive to

§ XIX.—*Do Coroners' Inquests return the Causes of Death more satisfactorily?*

With all due deference to the recommendations of men so well qualified, by position and public service, to advise in this matter, as Dr. Lankester and Dr. Buchanan, it may fairly be doubted whether the proposed appeal to the coroner and his court, in all obscure cases throughout the country, would solve each embarrassing question as completely and satisfactorily as prompt personal inquiry by a medico-legal officer; and certainly the latter method would be far simpler, more direct, and less expensive.

But—waiving that point for the present—before we assent to the particular course suggested by those gentlemen, it would be but reasonable to inquire a little into the working of coroners' inquests, and to see whether the recorded results of the system are so clear, true, and decisive as to warrant the demand for its extension to a larger number of cases.

'We have been told of the invaluable protection afforded to the public by this ancient institution; but when all the froth of so empty a boast has subsided, the plain fact remains that a very large proportion of coroners' inquests leaves the causes of deaths wholly unexplained.'

Many a coroner seems still to be satisfied with returning the old slovenly verdicts, as, for example, 'Died from natural

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crime; and he cited the following as instances where medical certificates were given which misled the registrar, and checked the coroner's inquiry:—

1. Certificates given by medical men called in after death. . . . . .
2. Cases in which hospital doctors and surgeons gave certificates of death for patients whom their students attended, and whom they had never seen alive or dead.
3. Cases in which medical men gave certificates of death upon merely hearsay evidence, not having seen the dead body.
4. Cases in which death, though occurring some time after an accident, had been owing to violence. (Lancet, 1863, vol. i. p. 608.)

causes.' Now, under this vague term may be included a great variety of destructive agencies, needing accurate definition, (1) deaths from epidemic, endemic, and contagious diseases, the main causes of which are removable under existing laws;[1] (2) deaths from starvation, ill-usage, poison, intoxication, &c.; (3) infanticide in all its forms, the extent of which cannot be reasonably estimated until still-births are properly registered. In each of these cases, the preservation of life, and the prevention as well as the detection of crime, alike require that thorough investigation be made by a scientific officer; yet in all, at present, the cause of death may easily be concealed under that indefinite and illusive verdict, 'Died from natural causes.'

Without any skilled inquiry a corpse may now be, and often is, buried by the coroner's warrant, earth hiding both the victim and the crime or breach of law which caused his fate. Even the farcical verdict, 'Died by the visitation of God,' is still occasionally returned, involving the impious though absurd admission, that the Almighty Disposer of Events has nothing to do with ordinary deaths. Then, how long the list of those common verdicts, 'Found dead'—'Cause unknown'! Here also the proportion which the number of verdicts, really explanatory of the cause of death, bears to the number of useless confessions of ignorance by coroner and jury, may be taken as an unerring test of the efficiency of the inquest system in any district.

The opinions of some of the highest legal authorities respecting the coroners' court ought to be generally known and candidly considered. At the Glasgow Congress of the Social Science Association, the Lord Advocate, speaking of the

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[1] Dr. Lankester was of opinion that a verdict of 'Manslaughter' could be directed against persons whose neglect of or refusal to obey sanitary enactments may have led to the deaths of others.

necessity for public prosecutors (as represented by Procurators Fiscal in Scotland), said:—

'I believe that nowhere in Europe is crime more uniformly investigated or more efficiently detected than it is with us. But if a coroner's inquest is wished in order to detect crime, if the object is to ascertain and detect occult and latent crime, I then say I would object to exchange a most efficient and philosophical machine for a very rough and doubtful one. . . . . .

'There can be no doubt that the quiet investigation which goes on in the Crown Office in Scotland is infinitely better adapted to detect facts than the investigation which takes place before a coroner's inquest, which gives warning to the guilty, which throws suspicion upon the innocent, and which, for the most part, though it has served its turn nobly, as the protection of England against arbitrary power, I believe not really to be conducive to the detection of the more secret and occult crimes.'

Again, at the Dublin Congress the Right Hon. Joseph Napier stated his belief—

'that in many cases the institution of coroners was worse than useless, arising from the class of (persons selected for) jurors and coroners in many parts of the country. As an instance, a coroner's jury in a certain part of Ireland, in a case where a person died from famine, found a verdict of wilful murder against Lord J. Russell.'

The Solicitor-General also remarked on the inefficiency of coroners' inquests—

'which were often calculated to lead to a failure and miscarriage of justice, so much so that the law officers of the Crown had in a great measure been obliged to disregard the verdict at inquests altogether. This arose, not only from the class of persons usually serving on coroners' juries, but also in consequence of the defective education of many of the coroners.'

Here is authoritative evidence of faults and abuses which bring disgrace, both at home and abroad, upon our medico-legal investigations, and which have been the subject of repeated exposure and reiterated complaint in public journals and scientific papers for years past.

Such questions as the following will soon force themselves upon the attention of the Legislature :—Whether the office of coroner, and the form and constitution of his court, are at the present day well adapted for their professed and original object; whether a public forensic inquiry is always necessary for the attainment of that object; if so, whether the long-established method of selecting coroners is the best that can be devised; whether all the chicanery and corruption and extravagant expenditure, inseparable from a contested election by county freeholders, must be still endured, by way of homage to the 'glorious principles of the British constitution'; whether England is wisely partitioned into 324 coronatorial jurisdictions of all sorts and sizes, from a little borough to a whole county; whether the average cost of an inquest (over three pounds) might not be better spent on a more rational method of inquiry; whether an assembly, consisting of a dozen or more small traders and street gossips, picked up in haste by the parish beadle and meeting in a tavern, under the presidency of a bustling attorney, and often without scientific evidence, can adequately represent the dignity and solemnity of a judicial inquiry into some sudden extinction of human life?

§ XX.—*Reforms in the Coroner's Court.*

During the last thirty years three notable attempts have been made to improve this singular system.

The most recent amendment (1860) needs but brief notice. In order to put an end to the discreditable disputes which were for ever arising between county magistrates and coroners about the necessity for holding inquests, when each inquiry imposed a separate charge on the county rates, it was enacted that the average amount of fees and allowances paid to the coroner for the preceding five years be commuted into a fixed salary. This was a wise and good measure as far as it went.

We owe the Medical Witnesses Act to the late Mr. Wakley. This empowers the coroner, at his own option, to call for the attendance of *any* legally-qualified medical practitioner, whether expert in medical jurisprudence or the contrary. It also provides for a pretence of remuneration out of the local rates. The ordinary guinea is doubled whenever a *post mortem* examination, with or without chemical analysis, is deemed necessary *by a majority of the jury;* but every practitioner is liable to a penalty of five pounds for declining this arduous and onerous service, however incompetent he may feel himself for it, and however great may be the sacrifice it may occasion him.

What may be the probable amount of benefit conferred on the public by the Medical Witnesses Act, I do not pretend to say. Certain it is, that our Legislature has never aimed at securing special knowledge and skill in the medical witness. No English Government has acknowledged the necessity for scientific referees, by whom the lawyer-coroners might be technically aided in any difficulty. It is no discredit to the great majority of physicians and surgeons that they are by no means specially trained and qualified to supply minute information, or to give conclusive opinions in obscure and perplexing cases, such as poisoning and infanticide.

Hear what Dr. Anstie said on this point:—

'With regard to the manner in which medical evidence is taken on coroners' inquests, it is almost impossible to overstate the evils of the present system; our best example, perhaps, will be one which is of frequent occurrence, namely, the investigation of a case where there is room for suspicion of infanticide, the proof turning mainly on the question whether the child was live-born? The majority of such cases present physiological problems of the deepest kind, such as would require an expert of the highest knowledge and skill to investigate them successfully, and a rather unusual power of interpretation to convey to laymen a just idea of the points of certainty and of uncertainty involved. The long and peculiar study of this subject from two quite

distinct points of view, the medical and legal, which would be necessary in order to achieve this kind of success, makes it quite impossible that a busy practitioner, fully engaged with ordinary duties, can acquire it.'[1]

A third attempt, not in Parliament, to redress the national grievance of forensic ignorance, has been the election of *medical coroners*. This measure was advocated with the laudable design of combining in one person the technical knowledge with the juridical function; and it has been adopted in several counties and boroughs. Doubtless there are striking instances of the success of this experiment. The remarkable energy, natural acumen, and readiness of resource which characterized the first medical coroner for Middlesex, far more than compensated for want of professional training and experience in the law. It might be truly said of him—*Coronator nascitur non fit.* Then he had no scientific competitors. To equal natural qualifications are now (1866) added that profound and extensive knowledge of the physical sciences, and that singular ease in imparting it to others, which distinguish his successor. These two exceptional appointments may be regarded as at once the highest tribute to the individuals and the severest condemnation to the system under which they have acted.

[1875. Long since these words were penned and published, medico-legal science has been deprived by death of Dr. Lankester. But the election of his able and experienced deputy, Dr. Hardwicke, is a most fortunate event.]

The election of a medical coroner may be regarded merely as a temporary expedient to supply a fundamental defect in the machinery of forensic inquiry.[2]

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[1] 'State Medicine.' *Macmillan's Magazine*, Feb. 1865, p. 309.

[1875. None who knew Dr. Anstie can doubt the greatness of the loss which medical science has sustained by his recent sad death.]

[2] 'It is a melancholy thought that in this great nation, so advanced in its civilization, so zealous, and in many respects so enlightened in its

There are very strong and, to my mind, unanswerable arguments for the separate representation, as well as for the combined action, of law and medicine in these inquests. The presiding officer is, in theory, both magistrate and judge. He needs therefore to be well versed in the technicalities of law, and to be prepared by study and practice for the particular duty of eliciting, sifting, and weighing evidence.[1] Such qualifications may be as reasonably demanded of members of the legal profession as the skill to detect and the ability to explain causes of diseases and death may be expected of medical men.

Thus it is that to the latter profession, or rather to a branch of it, specially instructed, qualified, and certificated for the purpose,[2] we must eventually resort for an element of not less importance than the legal in the constitution of the court, an element now in fact wanting; for whenever the ordinary physician, or even the expert, is brought in merely as witness for prosecution or defence, he is in an obviously false position. A thoroughly qualified referee would take his proper place as assessor, *amicus curiæ*, the authorized source of that technical knowledge without which

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philanthropy, justice and life should be left to the protection of such rude primitive processes as those of coroners' inquests, where there is not always the saving genius and science of a Lankester, and to the chance of competent witnesses.'—Dr. Symonds on State Medicine—Address at Leamington—1865.

[1] Dr. Anstie has well said:—'Let any one study with care some text-book of the laws of evidence (such, for instance, as the chapters on evidence in Mr. Fitzjames Stephen's admirable work on the "Criminal Law of England"), and he will perceive that the examination of testimony in courts of law is necessarily guided by an elaborate theory and by special rules of practice, which it requires the skill and knowledge that a special study alone can confer, to employ with effect in eliciting the true value of the statements of a witness.'—*Macmillan's Mag. Supra cit.* p. 311.

[2] For a fuller consideration of this point, see my *Proposal for the Institution of Degrees in State Medicine.* Macmillan and Co. London. 1865.

it is impossible to throw any light on the often mysterious subjects of these inquiries.

A very essential item of the duties of such an officer would be his superintendence, if not performance, of *post mortem* examinations, when required for purposes of justice or public safety. The wretched manner in which this duty is too often performed by persons unaccustomed to it, without special knowledge to guide or official instructions to direct them, is calculated to defeat the very object of inquiry, and to render nugatory all attempts at scientific research. On this point I may be excused for again availing myself of Dr. Lankester's remarks as follows:—

'A certain number of cases come before the coroner's court in which it is impossible to arrive at any conclusion as to what may be the cause of death. This sometimes arises from the inability of the medical man, even after an accurate *post mortem* examination, to say what may have caused death. There is, however, a great difference in medical men in this respect, some hesitating between a variety of causes, and placing the jury in a position of doubt, whilst others very readily adopt prevailing opinions as to the causes of death. The cases, however, in which the verdict of "Found dead" is recorded from want of a decided medical opinion, are very few, where the body has been examined shortly after death. I last year complained that frequently medical men were satisfied with incomplete *post mortem* examinations. They listen to the entreaties of relatives and friends not to extend their examinations further than is absolutely necessary, and, finding one organ sufficiently diseased to account for death, they leave the others unexamined. I should be glad if it could be arranged that all *post mortem* examinations could be made by some one or more gentlemen who had made this subject an especial study, and who, by devoting their whole time to it, would be able to draw up reports, which would form not only a valuable contribution to pathology, but would render more satisfactory the conclusions of the coroner's court with regard to the causes of death.'—*Second Report*, p. 195.

It is said that Dr. Lankester has announced that when he

orders a *post mortem* examination to be made, 'it is to be a thorough and not a partial examination, all the organs are to be tested, as poison has frequently been found where there was no suspicion of the kind.'[1]

Now if necroscopy in medico-legal cases is for the future to be conducted in this normal and complete manner, as unquestionably it ought to be, medical men engaged in ordinary practice will do wisely to pause and to weigh the consequences of undertaking any such duty. Far better to forego the paltry fee awarded by the Medical Witnesses Act, that is, if they can at the same time escape the penalty for declining to act, than to incur the obloquy of an unartistic and bungling attempt to solve a question on which the life, honour, or fortune of another may depend, and which always concerns the safety of society.

If the Legislature could be persuaded to establish a scientific organization of medico-legal officers, the very best means would be ready at hand in every district for immediate action in cases of sudden, suspicious, or unexplained death, without any sweeping innovation on old customs, or any surrender of existing institutions, which, though no longer necessary as safeguards against feudal tyranny, may nevertheless, with all their oddities, be popular, and so far useful.

[1] Some brief but useful hints towards preparation for these emergencies are to be found in a letter published in the *British Medical Journal* (Oct. 8, 1864). The anonymous writer was of opinion that, even if Dr. Lankester's order were generally observed, 'in nine-tenths of the cases the organs would be so spoiled by inexperienced hands as to prevent any safe conclusions being drawn from their condition, in really important cases, by practised analysts.'

Quite recently, a case exemplifying the mischief of committing *post mortem* examinations to unskilful persons, has come to my own knowledge. A death occurred after a very short and unintelligible illness; and it was deemed advisable to procure an analysis of the various contents of the peritoneal cavity. The surgeon in attendance accordingly sent them all, pell-mell, in a covered vessel to a well-known analyst. But what could the latter say or do, when he found the stomach slit open, and its contents mingled with the fluids and organs contained in the jar!

§ XXI.—*Conclusions and Suggestions.*

The foregoing considerations lead to the conclusion that in coroners' inquests generally, and in those especially where the coroner is not medical, and where no skilled and independent evidence is taken, the results are still less satisfactory and reliable than those of ordinary medical certification of the cause of death.

Thus, on a review of the evidence and arguments which have now been adduced concerning these two principal methods of obtaining ætiological information for mortuary returns, the proof seems to be complete, that—owing partly to the imperfection of the machinery employed to ascertain the causes of deaths, partly to the absence of any efficient means of verifying and correcting the reported facts, and partly to the errors inevitably resulting from a system of classifying fatal diseases, which has never received general assent,—the chances of error outweigh the probabilities of truth, the fallacies are multiform, and the defects, under existing arrangements, irremediable. It is impossible to admit that the certificates and verdicts of the causes of death, whether considered singly or grouped in classes, evince such a degree of accuracy as to constitute them safe and reliable data for calculation or induction. And I am compelled to agree with Dr. Buchanan, that 'the smallest evil of a system of registration, which admits of erroneous entries, is the vitiation, *pro tanto*, of all deductions from the death returns.'

Yet these are the 'facts' upon which a great national system is founded. Year by year a most careful and elaborate abstract of the alleged causes of mortality, under the direction of the most scientific statist of the age, is presented to the public. Once in every decennium a complete summary of the annual registers, with averages and rates re-calculated for the whole period—and in the last, with exceeding minuteness of information—issues from the General Register Office, pre-

faced by an essay of high value and interest. The products of these remarkable analyses are employed in many special investigations into the causation and distribution of disease, in many callings and conditions of life, and in each district of the kingdom. From these again originate a variety of administrative suggestions, leading sometimes to new measures of medical police, legal inquiry, and public hygiene.

How immensely important that the original units—the elementary atoms of the complex structure—should be real and true, that the 'facts' should be facts indeed! Otherwise the vast building rests on a foundation of sand, and its ruin is inevitable.

The preceding sketches of the many and long discussions which have taken place concerning our system of mortuary registration, especially with reference to returns of diseases and other causes of death, lead me to offer a few suggestions, embodying not only my own views, but also certain improvements which have been recommended either by members of the International Statistical Congress or by other well-known writers on the subject.

(*a*) One indispensable element—I may say the very foundation—of an efficient reform of the English system, is the organization of a body of medico-legal officers or state physicians, to be appointed to districts defined by known boundaries, including all parishes and places in the kingdom, and as extensive as may be compatible with the various public duties which would inevitably devolve upon them. The proposed officers should be empowered and required to superintend and verify the registration of births and deaths; to investigate all doubtful and uncertified cases; to act for or with the coroner in cases requiring inquests; to collect, analyze, and abstract the mortuary certificates, as well as the

returns of sickness to be made by the medical officers of districts and public institutions; to report the results and the statistical abstracts to local administrative authorities, for publication in their respective districts, and for transmission to a central department. The existence of a corps of sanitary superintendents, as verifiers of the fact and manner of death, is implied in the decisions of successive sessions of the International Statistical Congress.[1] I shall hereafter show why the medical officers of health, who have been appointed by a few parishes and boroughs under the Public Health Act, 1848, could not possibly supply the want of a general organization, without which it is impossible that the causes of death can be formally or fairly determined.

[1875. With equal truth may this be now said of the medical officers of health, now forced upon every 'district' by the Public Health Act of 1872.]

(*b*) The medical attendants of persons who die would also have their appointed place and function in a reformed system of mortuary registration. Every death occurring under the care of a legally-qualified physician or surgeon ought to be explained by his certificate. For this purpose it is worth considering whether three forms of certificate, corresponding to the three higher classes of causes—physiological, accidental, pathological—might not advantageously be adopted, nearly as proposed at the Vienna Congress;—that is to say, a form (*a*) relating to still-births, and to deaths of the newly born; a form (*b*) applying to deaths by violence, or accident,

[1] The appointment of such officers, under the title of *Kreis Physicus*, is of ancient date in the German States. M. Konarski, at the Paris Congress, 1855 (*Compte rendu*, p. 364), referred to the establishment of this system in Prussia and Bavaria, as the proper means of securing an accurate registration of the causes of death. And M. Marc d'Espine submitted the *préambule* of a project for the organization of district physicians by the several Governments of Europe.—*Introduction, Compte Rendu*, p. xxxix.

or unknown causes ; a form (*c*) relating to deaths in disease, in which might perhaps be included old age, unless this formed a separate class, or were included in the physiological class.

The medical attendant should have the option [which until 1874 he retained in England] of refusing a certificate, without incurring penalty or any civil or professional disability, unless Parliament should provide payment for the certificate, which I do not propose. If the certificate be rendered, as it ought to be, spontaneously and gratuitously, its form should be brief and simple ; the correct name of the immediate or proximate cause of death (according to a nomenclature appointed by authority) being all that need be required. He should not be required to certify to a single alleged fact of which he can know nothing by his own personal observation or examination. Any further information concerning antecedent or primary diseases, or their causes, might be entered at the option of the certifier on a separate form, constituting the first element in a national registration of sickness. The medical attendant should be legally protected against annoyance or injury in granting the certificate, by requiring him to send it, *folded* and *sealed*,[1] to the proposed medico-legal officer or sanitary superintendent of the district.

Deaths in prisons, hospitals, workhouses, or under the care of medical officers in any department of the public service, should be certified on a distinct form, with fuller particulars ; another important contribution to the registration of diseases.

(*c*) Should any one die without having been attended by a legally-qualified practitioner, or should the medical attendant decline to certify, or should the medical certificate be questionable or unsatisfactory, then, in any such case, the proposed medico-legal officer should himself make personal

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[1] 'Ce bulletin, rempli, signé, plié et cacheté,'—M. Bertillon, at the Paris Congress.—*Compte rendu*, p. 360.

inquiry, and if he deem it necessary, refer the case to the coroner. The report of the officer should be entitled to be received as evidence in any further legal inquiry, if not to rule the decision of the coroner's court.

(*d.*) In the event of a *post mortem* examination being required—perhaps in all such cases, certainly in those of doubtful and suspicious death—previous and timely information should be sent to the medico-legal officer, who should be present himself or by deputy, and if necessary direct or assist the necroscopy. Facts discovered by any such examination should be formally entered on the proper certificate of the cause of death.

(*e.*) Among other particulars of information to be required of the registrar should be (1) the precise place of death, (2) the anterior residence, birth-place, and parentage, (3) the profession or occupation, and the social condition of the deceased, as far as these could be ascertained.

(*f.*) The district physician should be at liberty to group the different kinds of disease and injury reported to him, according to his own view of their relations and causes, and the physical and social circumstances of the place.

Diseases, &c., being uniformly named according to an official nomenclature, and the cases in each district being accurately returned under their proper designations, there would be nothing to prevent any system of classification or arrangement being *afterwards* applied to the returns, by the central department or its inspectors; and this, either for general purposes or for special scientific researches.

[The great improvements made by Parliament during the last session (1874) in the registration of births and deaths may be noticed in the preface to this work.]

FALLACIES OF VITAL AND SANITARY STATISTICS.

[Chapter the Second.]

DEATH RATES.

I.—*Can the Death Rates of Districts under very different Physical Conditions, and containing different kinds of Population, be fairly compared for Social or Sanitary Objects?*

(1.) In the introductory chapter of this dissertation I brought forward some examples to show that the proportion which the deaths occurring in a very limited period of time in any town or district bear to its assumed population, is no true test either of the salubrity of the place or of the longevity and healthiness of its inhabitants. Yet the practice of quoting what are supposed to be local death-rates seems to be rapidly on the increase, and this under official sanction. Ten, and lately (1866) twelve, towns of the largest size have been thus favoured. The number of deaths in the week being multiplied by 52, or those in the quarter by 4, the ratios which the products bear to the estimated populations respectively are called *annual death-rates*. These numerical results are founded on two curious assumptions—first, that an annual death-rate may be determined from the mortality of any single week or quarter; and, secondly, that the population of each place, subjected to such calculation, has uniformly increased since the last census at the same rate as during the decennium before that census. Now, the former assumption almost refutes itself; and in the following section I shall adduce facts which go far to negative the latter, and therefore I cannot admit that results so obtained have any right to be termed death-rates; yet they are noticed and quoted as such by many, who believe in them implicitly, as unquestionable proofs of the actual and comparative vitality of the several populations, nay, even of their relative salubrity.

[1874.—The list of cities and boroughs, of which the weekly and quarterly 'death-rates' (so called) are now reported by the Registrar-General, contains eighteen of the largest English towns; and so far as the tables may be taken to prove the actual and relative condition of public health in the places tabulated, the extension of record is justly entitled to be called a great public benefit; while all praise is due to the Statistical Department of the General Register Office for this vigorous administrative effort.

Notwithstanding a brief explanation and forcible defence of the established death-rate system in a recent weekly return of the Registrar-General (October 31, 1874) with obvious reference to a not less vigorous attack, made with great fullness of valuable details by Dr. Letheby, President of the Metropolitan Health Officers, I venture to doubt whether the learned defender of the official returns has proved that these death-rates, as now indiscriminately used and unconditionally applied, are to be accepted as tests of the comparative health of these differing districts. Nor can I admit the correctness of terming the rate of mortality (supposing that to be absolutely true) for the week or quarter, an *annual* death-rate.

The argument from analogy, in the calculation of simple interest, does not, I think, apply fairly. The money question is simply one of arithmetic. The data are invariable. Although a weekly payment of 1*s.* 11*d.*, a monthly of 8*s.* 4*d.*, and a quarterly of 1*l.* 5*s.* 8*d.* (as every almanac tells us) means interest at the invariable rate of 5 *per cent. per annum*, and is very properly so called, it by no means follows that this common mode of calculation can be properly applied to physical phenomena, so variable that no law of nature has been deduced from them. There is no fear that the rate of interest for short periods would be misunderstood by the public, or misused by the political economist, by calling it '*annual;*' but when the events described are irregular and

uncertain in the highest degree, the rate for the period should be given exactly.

For example, at Portsmouth—because the rate of mortality for the week ending October 31, 1874, was, and ought to have been recorded as, 0·25 per 1,000 of the *estimated* population, or because the rate for the quarter ending October 3, 1874, was 4·57 per 1,000, it certainly does not follow that the *annual* rate of mortality may be safely quoted in the week at 13 per 1,000, or in the quarter at 18·3.

Such statements are not only perplexing to the unlearned public and the majority of newspaper readers,—not only are they likely to convey an erroneous impression as to the decennial and more true mortality of the place, but they circulate a false and dangerous impression as to local healthiness.

The corrected relative mortality of the towns compared, as we are wisely informed by the same official authority, 'should extend over about ten years.' Now, the decennial death-rate of Portsmouth at the last census has not, that I am aware of, been yet reported; but the annual death-rates for 1867, 1868, 1869, 1870, 1871, are said to have been respectively 20·9, 23, 22·3, 22·1, 19·3.[1]

Here, then, the annual death-rate appears to be decidedly on the decrease; but, supposing that the deeds or the misdeeds of the local sanitary authority had anything to do with death-rates, or sanitary conditions, or sanitary works, the rate of mortality ought to have increased, for the medical officer of health lately reported disgraceful and long-standing collections of filth and gross defects of structural arrangements, which would seem to have rather promoted than checked the said decrease of death-rate!

If then ratios, as well as facts, ought to be frequently published, for which there are many excellent reasons, might

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[1] *See* 34th Ann. Rep. R. G., Table 32, p. xc.

it not be as well to accustom the public to the correct arithmetical expression for the week or the quarter reported ?]

(2.) On the present system, the multitude of shifting conditions which, as I have shown, may and often do cause an excess of deaths contemporaneously with an unusual absence of sickness, or the converse, are ignored or forgotten. Heads of departments do not favour the establishment of a national organization for *local* inquiry and report. There are therefore no authorized means of rectifying official figures. The statistical delusion is propagated by the press, and now seems to be accepted by John Bull as an article of his national faith. Apparently few perceive that the shorter the period to which the calculation refers, the greater is the liability to error; that a large proportion of the deaths in the week, month, or quarter tell rather of the sickness and sorrow of past months and years than of what really belongs to the period reported; and that diversities and movements of population, in respect of ages, classes, industries, habits, and closeness of aggregation, as well as the very different physical features and dimensions of districts, render anything like comparison of their temporary death-rates, for practical objects, a mischievous absurdity.

It seems right, therefore, to show how widely and strangely the ordinary conditions of towns and inhabited districts differ, and how such differences affect the proportion of deaths to population, without indicating the relative prosperity of the communities or their true positions in the sanitary scale. I shall now consider those local conditions which depend on the sexes and ages of the population.

II.—*The Condition of Sex.*

In the whole of England and Wales, and at all ages, the excess of the death-rate of males over that of females is 1·73 per 1,000 In some places, and at certain ages, the

difference is immensely above that average. For instance, at Liverpool, for all ages, the male deaths exceed the female by 3·81 per 1,000; in Manchester, by 4·15. The difference is yet more striking in certain towns, if we take only the deaths under five years, *e.g.*, in Macclesfield, where male infants die at the rate of 15·63 per 1,000, and in Goole 16·10, faster than female infants. The causes of extraordinary boy mortality in these places have not been thoroughly investigated.[1] I need hardly specify the few instances in which the relative mortality of the sexes is reversed; but the general result deserves notice, that for all England there are only three quinquennial periods of life in which the female mortality is higher than the male, and these ages are 10–15, 15–20, and 25–30, the greatest excess being from 15 to 20.

A question here arises. In estimating the influence of locality and other circumstances upon the lives of a community, ought we to make use of the general death-rate—not distinguishing the sexes—or the death-rate of males alone, or that of females alone? Something may be said for either of these methods. Each probably has its peculiar advantages for particular districts. But to enforce any one as the rule for all places would lead to serious error, partly by reason of local differences in the proportion which, as we have seen, the deaths of one sex bear to those of the other, and partly also because the proportions of the sexes living (at the time of the census) differ greatly in the several districts of the kingdom.

In some commercial and manufacturing centres of population the women are greatly in excess, as in Bristol, Bradford, Norwich, Nottingham, Yarmouth, &c. In the textile towns, Manchester and Leeds, as we learn from Mr. Sargant, there is a large excess of females from 15 years of age up-

[1] Supp. to 25th Ann. Rep. R. G. p. lxii.–cxv.

wards, the largest excess being that in Manchester, from 20 to 25. There are certain branches of industry which demand the employment of females in greater number than the district can supply, and the deficiency is met by immigration from rural districts. But in some places of fashionable resort, and in districts inhabited largely by wealthy people, the preponderance of women is really marvellous. For example, while for England females exceed males by 5 per cent., the excess is 14·8 per cent. in London ;[1] 34 per cent. in St. George's, Hanover Square ; the same in Brighton ; 38 per cent. in Cheltenham ; 43 in Leamington ; 53 in Bath ; 73 in Clifton ! I leave it to sociologists to determine whether so overpowering a majority of the fair sex is the more likely to attract or alarm the other sex. It seems as though men die faster in places where women are more remarkably in excess. In London the death-rate for males is 25·7, for females 21·8 ; in Brighton, for males it is 25, for females less than 20 ; in Bath, males 24·78, females 20 ; in Leamington,[2] males 22, females nearly 17 ; in Clifton, 21 against 15·4 ; in Cheltenham, 20·75 against 17·68. The most favourable male death-rate of all these towns belongs to Cheltenham ; the lowest female death-rate to Clifton.

The superabundance of women in wealthy districts and watering places appears to be caused, not so much by a goodly array of lady-candidates for matrimony (a fact, by the bye, worthy of notice by bachelors and widowers), as by a large influx of another class of young women, candidates for domestic service. The latter, as Mr. Sargant has shown, are generally of the ages least liable to sickness and death. In serious illness or in later life, many of this class return into

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[1] Mr. Sargant, *Journal of Stat. Soc.*, June, 1864, p. 216 (Table B).

[2] These being sub-districts, it has been necessary to calculate the *female* mortality from ten annual registers and the census. Mr. Sargant has supplied us with the *male* mortality.

their native villages to die. So that the female death-rate is generally the lowest where the population-excess of women is the greatest.

For these reasons, Mr. Sargant prefers the male death-rate as a more reliable test of the vigour and vitality of the proper population of a place. At all events, in districts which contain a great disproportion of the sexes, as well as in those where the mortality of males and females is exceedingly different—especially at certain periods of life—the *general* death-rate ought never to be cited as evidence of the influence of locality upon life and health. It is said that, in his earlier publications, Dr. Farr held that the mortality prevalent among females was the safer criterion of local sanitary conditions—the life of women indicating more truly the state of the homes of the people; and so it does, undoubtedly, in many places. However, in the later reports of the Registrar-General, the independent value of the death-rate of each sex has been fully admitted; and we have now the advantage of being able to test every district and sub-district by the mortality of either sex.

III.—*The Condition of Age.*

Here, as in sex, the ages of the living as well as the ages of those who die in any district must be ascertained, before anyone can be justified in pronouncing an opinion upon its death-rate. Some most important facts respecting the various proportions of living and dying, in different towns and in different groups of districts, at each quinquennial or decennial stage of life, have been displayed by Dr. Farr, in his Supplementary Report on the mortality of the ten years, 1851–60. To that most valuable essay I would refer the curious reader for details, merely mentioning in this place a few general results which affect my argument.

As to age at death, it appears that, whereas in all England

the number of males dying at all ages is 23 per 1,000, the deaths of boys under 5 years of age are no less than 72·4 per 1,000; but from 5 to 10 years, the boy death-rate falls as low as 8·5 per 1,000; from 10 to 15 it is hardly 4·9; from 15 to 20 it begins again to rise, though still below 6·7; at 20 to 25 it stands at 8; and then, by decennial periods, the increments of the ratios gradually rise until, after 65, the rate of mortality is more than doubled at each succeeding decennium of life to its close. The same broad facts appear perhaps yet more strikingly by observing the proportion of deaths at *different* ages to a given number living at *all* ages. For instance, the mortality of both sexes in England was 22·17 per 1,000 (1851–60), but, of these 22 deaths, about 9 were under 5 years of age, and only the same number in the next 60 years of life; leaving little more than 4 per 1,000 to die after 65 years of age.[1] Thus, for the first quinquennium of life, the mortality is twelve times the mean mortality of the twelve succeeding quinquennia.

So much for the dying; and if the proportion of the population living at each age were the same in all districts, we might safely attribute any local excess or deficiency of deaths at particular periods of life to influences, bad or good, peculiar to the place. But what is the fact? The ratio of the living at different ages varies very considerably in different districts, although not so greatly as the ratio of the dying. So that—as Dr. Farr puts it—'independently of other causes of variation, the mortality of different populations will differ according as they consist of numbers in various proportions at the ages at which the mortality is high or low.' To make use, then, of an average death-rate in order to determine the vitality of populations of widely varying averages of age, is not only a statistical fiction, but it leads to practical mistakes.

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[1] Supp. to 25th Ann. Rep. R. G. p. xxvii.

Yet this blunder is being constantly perpetrated by careless or uninstructed retailers of official figures.

In newly settled territories, and in towns of recent growth and rapid increase, the ages of the people almost always stand at a low average. There is a surplusage of the young. Few, comparatively, die of old age and natural decay. Enterprise, hope, strenuous effort, alike neutralize, to a considerable extent, the fatal influences of climate, crowding of dwellings, and other local conditions unfavourable to health. Nevertheless, the death-rate is high; in some such places it is enormous. For, besides those morbific conditions—to which the whole excess of mortality is often most unreasonably attributed—the reproductive energies of these young communities are above the average; there is an extraordinary proportion of children; and the higher mortality, which, as we have seen, prevails everywhere, always, and inevitably, during the earliest years of life, raises the general death-rate, so as to place the new populations in an unfavourable light when compared with many less vigorous and less healthy, but older, communities.

On the other hand, we cannot accept the main facts of population and mortality in our manufacturing districts and sea-ports, or in the chief towns of our colonies and dependencies, as fairly exemplifying that normal overplus of deaths which depends solely on a rapid natural increase of population and on the immigration of young families. For in all those towns and settlements the laws of health have been ignorantly, if not wantonly, violated, as well in the selection of site and soil, as in the construction and juxta-position of dwellings,—as well in the pollution of the air, as in the defilement of rivers and water-courses,—as well in the destructive conditions under which employment has been offered to the working classes, as in the neglect of public and domestic cleanliness. In these populations, life—all that makes life

really valuable—has been prodigally sacrificed to the mere extension of commerce and acquisition of wealth.

Nevertheless, both here and elsewhere—especially if we compare the young settlements of America with the old communities of Europe—we shall find, on the one hand, towns of recent growth and thinly-peopled districts, containing an unusual proportion of young persons and children, strong and thriving, tolerably well housed and not badly nourished; and, on the other hand, we shall see ancient cities, the populations of which are maintained at an almost stationary number only by immigration from agricultural districts, and which display the time-honoured conditions of over-crowding, foul air, polluted water, and unwholesome occupations; yet shall the ratio of deaths to population in the former group of localities, owing to their redundance of child-life, stand at a higher figure than in the latter.

I shall have more to say respecting the shiftings and movements of population at different ages to and from the busy centres of trade and manufacture. It is sufficient here to remark that in many crowded seats of industry the influx chiefly consists of those who increase the proportion of the infantile population. Towns of this kind cannot be fairly compared with the districts from whence they receive their bread-seeking immigrants, and to which they send their prosperous emigrants. Dr. Whitehead, in his pamphlet on the mortality of Manchester, has a passage (not too long for quotation) which illustrates clearly the effect of such population movements upon the general death-rate. Here it is:

'In any population consisting of a *preponderance of young families*, the death-rate *per population* will always appear high in comparison with that of any other population where the opposite conditions prevail. But it does not hence follow that the causes of disease or of death are more potent in the first than in the second. The results may be mainly influenced by displacements, and by the ages and circumstances of those engaged in the inter-

change. The most notable instances of local translation of families observable in this kingdom are presented by the manufacturing as compared with the non-manufacturing districts. It is notorious that many of the families of manufacturing towns, at or about the middle period of life, are yearly retiring from business, and from the vicinity of the field of their successes, to spend the rest of their lives in tranquillity in localities beyond the precincts of their early activity. It is also known that the rising generation of both sexes in these and similarly constituted communities are systematically removed for educational purposes to seminaries elsewhere. The displacement thus effected is a process of lessening on the one hand and of accumulation on the other, without any equivalent interchange. There is no compensation by a similar movement hitherward; and the individuals engaged in this loss on one side and gain on the other, consist of the most healthy elements of the population—hale people of middle life in affluent circumstances, and of young people of both sexes who have surmounted the vicissitudes of childhood, amongst both of whom the death-rate is at the lowest. . . .

'It is true the manufacturing towns and districts are not without their immigrants; but these consist chiefly of young, often recently married, couples seeking a means of subsistence for themselves and offspring;' and their presence goes mainly to augment the ratio of deaths to population, though not to births.[1]

Few who have not examined this question are aware of the extent to which the *general* mortality depends on the *child* mortality of a population. So great is the effect of the latter upon the former that the remarkable difference of $10\frac{1}{2}$ per 1,000, which exists between the average decennial death-rate of large towns and that of country districts, is caused, to the extent of 8 per 1,000, by deaths under five years of age. In other words, if we strike out of the calculation all the deaths

[1] 'In a foundling hospital which only retained the children till five years old, the death-rate would be numerically high, however healthy the children might be; and a town with an abnormal number of young children would in that respect, though in a low degree, resemble a foundling hospital. A high numerical mortality so caused would not prove unhealthiness.'—Mr. Sargant, p. 174, *Statistical Journal*, June, 1864.

of children under 5 years old, the average mortality of the 63 selected rural districts is scarcely 2½ per 1,000 lower than that of the 30 most fatal town districts of England.[1]

Unless, therefore, general death-rates be corrected by assuming the same proportion of inhabitants at each period of life in the several places to be compared, no just or rational inference can be drawn as to their relative advantages for life and health. This process is called by Mr. Sargant—a comparison of the 'specific mortality' of districts.

IV.—*The Ratio of Infantile Mortality further considered.*

The death-rates of children have been too often quoted, or misquoted, as tests of local sanitary conditions, without a full comprehension of their meaning and value. Even were the census perfect, and the registration of births compulsory and complete—questions which will be considered hereafter—the proportion of deaths during early infancy must be a most inadequate exponent of the healthiness of any community, depending as it does mainly on the number of births, or rather on the number of living infants. In a vigorous young population, the births being above the average, the infantile death-rate will also be excessive, even under the best sanitary conditions. It seems to be a law of nature—always in operation—that organic life is most liable to perish in its earliest stages, the liability decreasing in something like geometrical progression until the plant or animal becomes full-grown and the reproductive function is established. The succession of the species being thus secured, the chances of destruction again increase; and as the living structures degenerate and decay, Death cuts down his victims more and more rapidly until his conquest is complete. A rapid fall and then a

[1] Supp. to 25th Ann. Rep. R. G., p. xxvii. 'A high or low total death-rate depends chiefly upon the mortality amongst children.'—Dr. Braithwaite on the High Death-Rate in Leeds, 1865, p. 8.

gradual rise of the death-rate, from the beginning to the end of life, is a physiological necessity. How much of the fall and rise of mortality according to age, which actually occurs in any community or class, depends on that natural law, and how much on artificial, or abnormal, or preventable circumstances cannot yet be determined. But when Parliament shall have established an efficient organization of qualified local agents for special investigation into the facts of life, health, and death in every district of the kingdom, we may know what proportion of child mortality is rightly attributable to physiological causes, to hereditary tendencies, and to congenital defects. Not that these causes are wholly unpreventable; their influence may doubtless be controlled, to a very great extent, by progressive improvements of the race —improvements in material form and structure, in intelligence, in morals; and this true reformation would most surely be promoted by a higher and better education of the masses, and by the spread of a practical Christianity.

When a superior machinery for inquiry shall have been instituted, we should know what proportion of the death-rate of children can be fairly said to depend on industrial conditions, *e.g.*, on needless sacrifice of health and life in ill-regulated work places,—on the full-time employment of adult women, as well in agriculture as in manufacture,[1]—on 'the withdrawal of children from the mother's care, and the consequent substitution of artificial feeding (and that of the worst kind) for the natural diet of infancy.'[2] We might then know something more definite about the numbers killed by starvation, by the reckless administration of opiates, and by more straightforward modes of infanticide; as well as of the number perishing from the mere carelessness, apathy,

[1] See Sixth Ann. Rep. of Medical Officer of Privy Council.

[2] Dr. Greenhow: Papers relating to the Sanitary State of the People of England, p. 133.

or ignorance of mothers. We might then also be credibly informed respecting the proportion of child mortality which follows upon illegitimacy of birth; and again, how much of it is due directly to the drunkenness of either or both parents,[1] or indirectly (and doubtless largely) to the habitual and deliberate intemperance of husbands and fathers.

The anonymous author of an able brochure, entitled *Infant Mortality and Deficient Legislation*, has shown, by reference to law reports and other authentic records, that great numbers of working men who may be in receipt of good wages, which they spend in gluttony and drunkenness, neglect or refuse to provide food for their families. In many horrible cases, the details of which are published, this cool and premeditated refusal—unheard of among savages—has ended in the wife or child being literally starved to death. The wide prevalence of selfish indulgence on the part of the husband, and the singular fact—bitterly known to many a wife—that the law affords her no protection so long as her husband does not desert her, have unquestionably led to the more general employment of married women in the field, the workshop, and the factory.

Lastly, the time may come when—under a well-organized system of local inspection—the public, the local authorities, and Parliament itself may discover how much of this

[1] 'According to the statistics for 1863, upwards of 4,000 cases of suffocation of infants from the drunkenness of their parents occur throughout the United Kingdom every year, on these days alone—Saturdays, Sundays, and Mondays.' (*Mr. James Raper—Soc. Sci. Trans.*, 1864, p. 579.)

'The greater number of these cases occur on the Sunday; the parents, having been paid their wages on Saturday, get drunk and neglect their children.' (*Dr. Trench, ibid.*)

'I think that at least 25 per cent. of these cases of suffocation arise from the drunkenness of one or both of the parents. I believe that drunkenness is one of the great causes of crime in our country, and the frequent and fruitful cause of infant mortality.' (*Dr. Lankester, ibid.*, p. 581.)

domestic misery, crime, and mortality depends merely on excessive density of population, and how much on the wretched state of the crowded dens and hovels of the poor, both in town and country. We may then be enabled more accurately to estimate the fatal effects of what are commonly called unsanitary conditions, such as 'the foul air and foul water of undrained, unpaved, unscavenged, unwashed, unlighted, unventilated localities and houses.' (*Simon, Report*, 1858.) But it must not be forgotten that the latter sources of evil are in a great degree secondary to certain anterior conditions of society, which, as prior causes, require a higher order of preventive remedies than a succession of mere 'Nuisances Removal Acts'—measures not only defective but ineffective, because some of their best provisions are evaded or obstructed by the very Boards which have been empowered by the Legislature to carry them into operation.

Is the nation to shrink from a thorough investigation into the causes of disease and death, lest that should disclose a depth of moral and social degradation unutterably disgraceful to our boasted civilization?

V.—*Is the Census of the People correct?*

This question deserves attention, if it cannot be conclusively answered, before dismissing the consideration of age and other conditions in their influence on the death-rate.

Mr. Sargant and others reply in the negative. They say that the method and machinery of enumeration render the census particularly liable to error; and by a series of calculations more elaborate than intelligible[1] Mr. Sargant has endeavoured to prove that the numbers returned by the Census Commissioners, as living at each year of infancy and at each subsequent quinquennial period of life, are by no

[1] In his Paper read before the Statistical Society of London, Jan., 1865.

means to be trusted, either for the whole of England or for certain districts in which he believed the error to be excessive. Calculating the natural increase of population from the registers of births and deaths, he has estimated a deficiency in the returns of infants under one year of age, amounting to 12 per cent. of males and $10\frac{1}{2}$ per cent. of females; and of all under five years, a deficiency of $6\frac{3}{4}$ and 6 per cent. of boys and girls respectively. He has, moreover, concluded that the whole population of England is underrated by more than half-a-million.

Dr. Farr, holding the vantage-ground of full official information, replied effectively at the following meeting of the Statistical Society. He described the arrangements and organization for the census as appropriate and complete, and declared his confidence in the results. Whether he fully succeeded in proving the efficiency of the census machinery and the accuracy of its work, may be fairly doubted; but, beyond all question, he exposed some errors in the inferences of his critic,—for instance, he made it clear that the infantile death-rate of the Registrar-General does *not* mean the proportion of deaths to infants left alive at the end of the year. He admitted, nevertheless, that a mistake had been made in requiring returns of the numbers living in each of the first five years of life, and he confessed the general inaccuracy of the census as regards age. 'The whole of Mr. Sargant's case,' said he, 'turns upon the babies.' They were often, it seems, set down by their parents—if not by the enumerators—as a year older than they really were. Thus, when in their first, second, or third year, they were returned as one, two, or three years old; and the true number living *under* each year was mis-stated accordingly. In the first year of life, especially, the census gives much too low a figure, which of course does not correspond with the balance of births over deaths in the register. But granting that an unknown

number of infants were not returned in their proper groups, it does not follow that they were not reckoned at all in the census. On Dr. Farr's hypothesis, a considerable proportion of the yearlings, whom Mr. Sargant believed to be altogether missing in the census, might be recovered during the first five years of life. A further allowance might be made for infants carried abroad by young married emigrants; and we are assured that after the first quinquennium, 'the census picks up thousands every year.'

These contradictory estimates, however, leave a painful degree of uncertainty on the point; and one cannot help feeling some anxiety about the possible fate of those unhappy babies, registered as born, not registered as having died or emigrated, and yet not to be found among the number reported alive. Whether the Ogre of the census had devoured a few hundreds only instead of a few thousands of these innocents, or whether all the missing little ones had been carried off by Major Graham's fairies, to appear again as changelings of a larger growth, the result is anything but satisfactory, and, to speak seriously, anything but creditable to the accuracy of our national statistics.

But on surer grounds than that of arithmetical assumption, I must agree with Mr. Sargant that the English method of enumeration is necessarily liable to grave error, owing to (1) the infrequency of the census, (2) the incompetence of the enumerators, and (3) the misrepresentations of the enumerated.

In remote parts of the country, and especially in ill-conditioned town districts, where many 'householders' are scarcely better, some even worse, than vagrants,—ignorance, indifference, suspicion, and antagonism can hardly have failed to vitiate returns, made on a single day by enumerators, most of whom, however willing and honest, had neither been trained to their duty nor accustomed to its performance. It

would be nothing short of a miracle if the 30,862 men employed for a day's work once in ten years, had been both uniformly correct in their own statements, and also competent to detect the numerous errors in the schedules of stupid or obstructive householders. Nor is it likely that any revision at the Census Office could restore reasonable accuracy to returns originally false. Occupiers letting lodgings in the worst and most crowded localities are too often harbourers of the dangerous classes, and have therefore the strongest motives to misrepresent facts, while they are quite sharp enough to hoodwink the good folks who are hired for the nonce to take account of them and their inmates. There are also many social conditions which tempt the people to mis-state ages. To say nothing of the admitted fallacy of female estimates on this point, there are many thousands of children employed under the Factory and other Acts, whose 'parents have a pecuniary interest in calling their children older than they really are, and they would probably be careful not to contradict, in the census return, any lie they had told elsewhere.'[1] All these considerations point out the necessity for great tact and experience in those who collect the original facts. Enumerators who have been employed on more than one census have openly confessed that their labours were performed with greater readiness and accuracy on the second occasion than on the first. How much does such a confession imply?

Of the many objections, administrative and scientific, to so long an interval as ten years between the numberings of the people, this one at least is obvious enough, that a large proportion of the persons employed are not trained and cannot possibly be habituated to their work.

It has been suggested that a quinquennial census as in France, or a triennial as in some German States, would par-

[1] Mr. Sargant, *Statistical Journal*, March 1865, p. 90.

tially remove these and other objections.[1] If a change be made, however, why not adopt the more simple and perfect system of *annual* enumeration?

[1875.—The only good reason hitherto given for retaining our decennial census, without any intermediate facts, is the value attached to custom and precedent by the English nation.]

The more elaborate details of inquiry might be reserved for a grand decennial census, but once a year the inhabitants of every town and district ought to be counted according to age, sex, and birth-place. The expense of each minor annual reckoning would be very small compared with that of the decennial census, and the enumerators, if permanently engaged, would do their work more quickly, skilfully, and correctly.

Why, then, might not some permanent body, as the police, or perhaps even the letter carriers of the Post Office, be employed in this service? Continually on duty in their respective beats, aware of population-movements,—the police especially being cognizant of the migrations of the poorer classes, and accustomed to act under direction, with method and regularity,—they would surely prove a more competent agency and a more economical machinery for this purpose. The constabulary in Ireland are already employed on the census, as well as in the collection of agricultural statistics; and the evidence taken before the Select Committee on births, deaths, and marriages in Ireland has shown how correctly, systematically, and satisfactorily to all classes those duties were performed. In employing either the constabulary or the Post Office staff for the census in England, the registrars might still be the superintending officers, and the enumeration districts determined as before by the Registration Department.

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[1] In Prussia, Bavaria, Saxony, and the other states of the Zollverein, and in Belgium, the census was triennial, and was supplemented by a fuller census every twelve years. In France and Denmark it was quinquennial. Sweden and Holland alone followed the English period; and in a few states an additional minor census was taken annually.

VI.—*Are Estimates of Population of real use?*

It is almost needless to repeat that any error, proved or probable, in the census, either of numbers or of ages, casts a dark shadow of doubt upon the published death-rates. But if the authorized enumeration can hardly be depended on, what are we to say of those estimates of population which are continually made or employed by sanitary writers, in order to 'determine,' as they say, the death-rate for some intermediate year or years of the decennium? These utterly unreliable and often mischievous calculations depend generally on one of the following assumptions:—First, it may appear, by reference to the census, that the inhabitants of some town have increased in number during the preceding ten years in a certain ratio, and it is accordingly assumed that the annual average of that ratio is continued during the current decennium. The fallacy of this hypothesis has been proved in numerous instances. Secondly, the census may show that in a certain district the average number of persons to each inhabited house was (say) five; and having learnt from the rate-collectors or the police that the number of inhabited houses has increased since the census by so many, the calculator multiplies the number of new houses by five, and then assumes that the result represents the increase of population. This estimate has turned out to be no less fallacious than the former. Yet one or both of these methods are for ever being employed by sanitary prophets in proclaiming temporary death-rates for towns or districts, to amuse or frighten, if not to enlighten, the inhabitants. A curious instance of the blunders made by these anticipators of events was exposed at Bradford in 1861 [1]:—

'In 1851 the borough of Bradford contained a population of 103,786, and 19,002 inhabited houses, being 5·46 persons to a house. In proceedings in Parliament in 1858, and in the prepa-

[1] Transactions of Social Science Association, 1862, p. lii.

ration of the various papers read at the meeting of the Association in 1859, and for other purposes, it was assumed that the population in those years amounted to about 130,000, whilst the census of 1861 showed an actual population of 106,203 only, and 22,542 inhabited houses, being 4·72 persons to a house. This over-estimate of the population has arisen from three causes: 1st, in assuming that the number of persons in each house would be the same in 1861 as in 1851; 2nd, in assuming the increase of houses to be equal to the number for which plans are approved, with a deduction of 10 per cent. for houses not built and old buildings displaced and discontinued for habitation; 3rd, in assuming the number of unoccupied houses to be no greater in 1861 than in 1851.' [Three unwarrantable assumptions.]—*Report on Bradford, ibid.*, p. liii.

The official announcement came upon the calculators like a thunder-clap. Actually 24,000 inhabitants fewer in 1861 than were assumed to exist in 1859! We are not told what grand projects of borough improvement, what commercial speculations, were based on the over-estimate. Let us hope that no serious losses were incurred by those *Chateaux en Espagne*. The results of enumeration differing so widely from the predictions, it was at first supposed that the enumerators had been guilty of some serious omissions. A more precise inquiry as to houses was directed by the town clerk, and made by the constabulary, and about 450 more houses were discovered; but the people were not again reckoned, and the census was patiently submitted to.

At Liverpool, also, similar prognostications were falsified by events. The late Dr. Duncan, one of our most able sanitary labourers, computed—though by what method we are not informed—that the population amounted to 472,000. The census, taken soon after the incautious estimate, credited Liverpool with only 443,930, or 28,070 less than the number assumed. Dr. Trench adds that if the method of calculation recognized by most statists had been adopted—that is, by assuming a similar rate of increase in the current as in the

past decennium—the error would have amounted to 49,178! So improbable did the correction of these estimates by the census appear, that Dr. Trench justified 'the scepticism entertained by some as to the accuracy of the Liverpool returns of population.' The difference between the estimate and the enumeration was, in his opinion, '*large enough to falsify all former, and to render doubtful all future, conclusions on our rates of mortality.*' This eminent officer of health infers, curiously enough, that 'the first lesson taught by a census is the re-adjustment of the calculated rates of mortality in former years.' A valid reason for a decennial census—to correct mistaken estimates made in default of authorized annual enumerations![1]

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[1] [1875.—That some remarkable mistakes were made in the ESTIMATES of population on which our death-rates are based in the principal towns and districts of England for the year 1871, may be proved by comparing these figures with the results of actual enumeration just afterwards published in the census of that year. We were then afforded an opportunity of practising the 'first lesson,' which Dr. Trench informed us was to be learned from a new census, namely, the re-adjustment of the calculated rates of mortality.

The following tables are taken from those marked (vi.) and (ix.) in the Quarterly Return of the Registrar-General, No. 89, and are compiled and corrected for me by Mr. Presley, librarian of the Cheltenham Library. Table vi. contains the sixteen largest provincial cities and boroughs of England; and it shows in column 1 the population *estimated* for the middle of 1871 from the population of the census 1861. Column 2 shows the actual enumeration which had been just completed for the new census. Column 3 shows the excess or failure of the estimates. Column 4 gives the deaths in the first quarter of 1871, just preceding the census. Column 5, the death-rate (called 'annual') for the same quarter, calculated upon the estimate (*see* Quarterly Return). Column 6 gives the same calculation corrected by Mr. Presley, who discovered that only two of the sixteen official calculations were correct. In most of them the official figures were considerably in excess of the corrected. Column 7 gives the 'annual' death-rate for the *quarter* on the population recently enumerated, and therefore tests the real amount of error caused by the difference between estimate and enumeration. Mr. Presley has added two columns, one (8) being the death-rate for the year 1871, calculated upon the census and the actual deaths of the year; the other (9) giving the death-rate

Frivolous as may be such calculations, and worthless as death-rates so derived, they inflict a real and lasting injury

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for the decennium 1851-60, that for 1861–70 not being yet published. Thus a tolerably comprehensive view is presented of the various and discrepant death-rates for which each place is responsible.

From TABLE VI.

—	1. Estimated Population in middle of 1871.	2. Enumerated Pop. by Census of 1871.	3. Excess or Defect of Col. 1.	4. Deaths in Quarter ending April 1.	5. Death-rate for Quarter calculated on Estimated Pop.	6. The same corrected.	7. Death-rate for Quarter reckoned on Enumerated Pop.	8. Death-rate for Year 1871.	9. Death-rate (10 Years) 1851–60. Mean Pop.
Portsmouth .	125,464	113,569	+11,895	520	16·6	16·576	18·3	19·3	23
Norwich . .	81,787	80,386	+1,401	506	24·8	24·744	25·2	25·9	25
Bristol [ton	173,364	182,552	−9,188	1180	27·3	27·224	25·9	23·2	28
Wolverhamp-	74,438	68,291	+6,147	440	23·7	23·640	25·8	28·0	28
Birmingham .	378,574	343,787	+34,787	2406	25·5	25·420	28·0	24·9	27
Leicester . .	101,367	95,220	+6,147	672	26·6	26·516	28·2	26·8	25
Nottingham .	90,480	86,621	+3,859	544	24·1	24·048	25·1	26·0	27
Liverpool . .	526,225	493,405	+32,820	5725	43·7	43·516	46·4	35·1	33
Manchester .	379,140	351,189	+27,951	2669	28·3	28·156	30·4	31·2	31
Salford . .	123,851	124,801	−950	833	27·0	26·900	26·7	30·4	26
Bradford . .	148,030	145,830	+2,200	999	27·1	26·992	27·4	25·5	26
Leeds . . .	266,108	259,212	+6,896	1702	25·7	25·596	26·3	26·4	28
Sheffield . .	255,247	239,946	+15,301	1601	25·2	25·088	26·7	28·3	23
Hull . . .	135,195	121,892	+13,303	704	20·9	20·832	23·1	23·2	25
Sunderland .	103,037	98,242	+4,795	685	26·7	26·592	27·9	36·5	25
Newcastle . .	136,293	128,443	+7,850	899	26·5	26·384	27·9	32·2	27

From TABLE IX.

—	1. Estimated Population in middle of 1871.	2. Enumerated Pop. by Census of 1871.	3. Excess or Defect of Col. 1.	4. Deaths in Quarter ending April 1.	5. Death-rate for Quarter on the Estimated Pop.	6. Death-rate for Quarter on Enumerated Pop.	7. Death-rate (10 years) 1851–60. Mean Pop.
Gosport . .	30,355	22,644	+7,911	147	19·2	26·0	26
Cambridge . .	25,083	30,078	−4,992	197	31·4	26·2	20
Walsall . .	59,172	48,836	+10,336	289	19·5	23·7	26
Dudley . .	53,492	43,791	+9,701	311	23·3	28·4	26
Ashton-under-Lyne	38,730	31,441	+7,291	216	22·3	27·5	27
Preston . .	99,431	85,427	+14,004	700	28·2	32·8	27
Merthyr Tydfil .	114,492	95,046	+19,446	635	22·2	26·7	29

on the good cause of sanitary progress, when they serve to destroy public confidence in the science of vital statistics.

If it be a matter of national importance that the public, the local authorities, and the Government should be duly and

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Now we find that the estimate for Portsmouth was so greatly in excess of the fact that the quarter's (annual) death-rate was reported as 16·6 instead of 18·3. The same calculation for Bristol, where the error was in the opposite direction, shows 27·3 instead of 25·9. If the healthiness of the two towns had been absurdly tested by the estimates, Bristol would have shown an excess of death-rate 10·7 per 1,000 over Portsmouth, whereas the real excess, for that quarter only, was not more than 7·6!

Even this excess seems to be only temporary and casual, for if the comparison be extended to the whole of the year 1871, the excess sinks to less than 4 instead of 10 per 1,000.

A statement of this kind circulated through the kingdom as a comparative view of local death-rates, cannot but lead to serious delusion, especially when people believe that these figures represent comparative local salubrities.

The excess of the estimates of population in almost all the great northern towns shows the utter fallacy of the principle on which these estimates are calculated. Thus, owing to the reported excess of population the death-rate *per estimate* at Birmingham for the quarter only is 2·5 below the fact; that at Liverpool 2·8, and at Manchester 2·2 below the fact, even for a single quarter. Taking the real death-rate for 1871, the numbers are exceedingly different; Birmingham showing 24·9, Liverpool 35·1, and Manchester 31·2; and for the decennium ending 1860, 27, 33, and 31 respectively.

The 50 smaller towns, reported in Table ix. (Registrar-General's Quarterly Returns), generally show great discrepancy between the estimated and the enumerated population. Seven are chosen to show some of the strangely erroneous conclusions to which estimates may lead. In one only of these (Cambridge) is the estimated population below the enumerated; in the rest the excess appears very remarkable. Thus the death-rate at Cambridge is made out to be nearly 5·2 above the fact; while at Gosport it is nearly 7 below, at Walsall 4·2, at Dudley 5·1, at Ashton 5·2, at Preston 4·6, and at Merthyr 4·5, all below the fact. Now, suppose a comparison for health purposes had been made according to that quarterly return between Cambridge and any one of the other six towns; the former would have shown a mortality of from 3 to 12 per 1,000 above the rest; the fact being that its actual decennial mortality is below them all. Are these mis-statements unimportant? 'Are they not large enough,' as Dr. Trench says, 'to falsify all former and to render doubtful all future conclusions on our rates of mortality,' when calculated from estimates of population?

accurately informed respecting the numbers, the ages, the condition, and the dwellings of the people, such information must be supplied by a more efficient organization, and by an authentic *annual* report.

The census ought to be as free from suspicion as Cæsar's wife; but, as it is now the subject of scandal, and as hypothetical corrections for intermediate years make it of worse than doubtful reputation, we ought at least to be able to turn to the registry of births, as well as to that of deaths, for something like veritable information concerning the natural increase of population.

VII.—*Registration of Births—what is its Statistical Value, especially as regards Infantile Mortality?*

The chiefs of this department confess that the register of births is defective to the extent of nearly 6 per cent. for the whole of England, the amount of error varying to an unknown extent in different districts. The commissioners of the census admit that at least 369,489 births were left unregistered during the last decennium. Mr. Sargant believes the deficit to be 7½ per cent. Without precise information as to the source and amount of error in each place, we have no means of rectifying the national records.

Now, were the registration of births complete, the proportion of births to deaths *during the first year of life* would probably be a more accurate mode of expressing the rate of infantile mortality than the proportion of deaths to population, since migration does not greatly affect the result at this early age. The birth-death rate has been strongly recommended by Dr. Whitehead, of Manchester, who says that it is preferred by the French and other continental statists. But unless the population were immovable or nearly so, or unless the number of emigrants and of immigrants, and the deaths among each, were correctly ascertained, the

increase or decrease of the natives could not be exactly determined. And it is only as a means of calculating 'natural increase' that the birth-death rate has been advocated by the best statists. A prolific population is not necessarily a healthy one. Fecundity and mortality too often go hand-in-hand, and the ratio of births to deaths may be the same in the most degraded, short-lived, and unhealthy populations, as in the most flourishing and civilized. As a test of vitality, the birth-death rate becomes less and less reliable in each succeeding year of life; and at no age is it a safe test either of local salubrity or of hygienic management.[1]

The rate of infantile mortality has often been overstated, not merely by ardent sanitarians, but even by acknowledged authorities on public health. The exaggeration may be partly owing to erroneous methods of calculation, but is mainly attributable to defect of data; for the census, supposing it to be correct as to the number of persons, is admitted to return infants at wrong ages, and the register of births is avowedly imperfect.

It would, indeed, be unreasonable to expect the same accuracy and completeness in the record of births as in that of deaths. The beginning of life, even of separate existence, is not so clearly marked an event as the extinction of life. It does not belong to so homogeneous a class of events. Between those births which are certainly and unquestionably 'still'—cases in which fœtal life had absolutely ceased before birth—and those of actively living children born at the 'full time,' there exists a large number of uncertain, premature, and abnormal births; many in which it is doubtful whether life had ceased before separation from the mother;

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[1] There is an excellent paper on this and other cognate questions in the Report for 1863 of the Manchester Sanitary Association, by Messrs. Ransom and Royston, entitled 'Numerical Tests of the Health of Towns.'

many in which it ceased so quickly afterwards, from a variety of causes, that considerable licence must be allowed to the informants (or at all events will be taken by them) as to the nature of their report, and in which it becomes a question whether the case should be reckoned among both births and deaths, or in a separate category; many in which, though avowedly born alive, the being was immature, or malformed, or structurally defective, or hereditarily diseased, and so lacking the ordinary chances of life. Dr. Farr informs us that deaths from premature births amount to 7·3 per cent. of the total deaths of infants under one year of age:

'So that to obtain the rate of mortality among children *born at the full term of nine months*, the premature children, if we had the means, should be struck out of the account both of the living and dying. This is impossible in the present state of statistical observation. But it happens that these deaths of premature children serve as probably more than a sufficient set-off against the infants of full term dying soon and escaping registration.'

It is not for me to say how far this method of counterpoising error by error may satisfy the honest seeker for truth. It is enough to have shown that on the present system of registration no distinct provision is made either for still-births or for doubtful and imperfect births. Great improvements might doubtless be introduced into the register of births, increasing its value as a statistical, judicial, and administrative document, although for the above reasons it can never be so positive a record as the register of deaths.

VIII.—*Is an excessive proportion of Births in any Community clear evidence of its low Sanitary Condition?*

Thirty or forty years ago some celebrated statists, especially on the continent, would have answered this question by a decided affirmative. They succeeded in establishing an almost invariable connection between an apparently high

degree of fecundity and an excessive rate of mortality. But even if the latter were—though it has been shown in many cases not to be—a sure test of local unhealthiness, the coincidence of high rates of nativity and mortality might possibly be due to other circumstances. A few facts, however, will help us briefly to discuss this question. Mr. Chadwick observed,[1] in 1842, that in Manchester and Leeds, where the annual deaths were 1 in every 31 and 37 inhabitants, the births were 1 in 25 and 26; while in the county of Rutland, typical of most agricultural populations, where the deaths were 1 in 52 inhabitants, the births also sunk to 1 in 33, that is to say, the births in large towns were to those in the country as 4 to 3.

The calculations of M. Mallet in Geneva, M. Bossi in France, and M. Quetelet in Belgium, confirmed Mr. Chadwick's conclusion. Both birth and death-rates appear to have fallen together, almost *pari passu*, as civilization and social conditions advanced. Thus, in France, 1784, it seems from researches made under Necker's direction, that there was one birth in every 25·5 inhabitants, one death in every 30. But at a later date, 1816–31, the proportions became one birth in 32, and one death in 39·8. The births had decreased from 4 to 3 per cent., the deaths from $3\frac{1}{3}$ to $2\frac{1}{2}$. Compare, on the same point, the five greatest nations of Europe.[2] The birth-rates were in the following order:—England, 32 per 1,000; France, 28·3; Prussia, 37·6; Austria, 38·7; Russia, 42·8; while the death-rates were respectively 22, 24, 26, 30, and 35; showing almost invariably a coincident increase of birth and death-rates; France and England alone changing places in the columns, and the natural increase being greatest in England and Prussia.

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[1] Gen. San. Rep., p. 179.

[2] Sixth Ann. Rep. R. G., p. xxxix.

On comparing the same facts in the English counties, the results on the whole supported the concurrence of a high ratio of births with an excessive mortality; and this especially in the populous town districts, although the registration of births is there most defective.

The excess of births over deaths, or the natural increase of population, does not generally appear to be in direct proportion to the increase of the birth-rate, for a still greater rise in the mortality occurs, whether as cause or effect, to check as it were the progress of population. A table furnished by the Registrar-General to Mr. Chadwick may be quoted in illustration. Dividing the districts of the metropolis into five groups, according to their rates of mortality, it was found that in the most fatal group, where the death-rate was 31·4, the birth-rate was 36·6, or as 6 to 7; but in that called the 'healthiest' group, where the mortality was only 18·7, the birth-rate was 24·7, or as 6 to 8; the *balance* of natural increase being as two to one in favour of the best districts.[1]

That an increase in the reproductive powers of a community argues a depression of its sanitary state is indeed too absurd a position to be maintained against common sense.[2]

The true solution of the apparent increase of prolificness in crowded districts lies in their greater proportion of inhabitants at the reproductive period of life. An excess of births, like an excess of deaths, depends mainly on the ages of the living population. In a comparatively young and healthy community both rates will be high; and so they are in towns containing an undue proportion of persons at the

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[1] *Statistical Journal*, April, 1844, p. 17. The same results appear in Mr. Porter's Paper on the Census, from comparing groups of the English counties.—*General Sanitary Report*, p. 186.

A similar comparison at the present day would be interesting.

[2] 'It certainly would be important to know that a sickly and depraved community possessed a greater reproductive power than a healthy and robust people.'—Mr. Neison, *Statistical Journal*, April, 1844, p. 51.

ages of 20–40. For instance, in remarking on Mr. Chadwick's comparison of the metropolitan births—1 in 37—with those of Herefordshire—1 in 44,[1]—Mr. Neison showed that the population between 20 and 40 years of age was 36·33 per cent. in London, but only 28·39 in the healthy county.

If the births in London had borne the same proportion to the younger adults as in Hereford, the birth-rate would have been 1 in 34·38 instead of only 1 in 37. That is to say, the men and women of London, instead of producing *more* children than the men and women of Hereford, as was at first supposed, had really produced *fewer* in proportion to their numbers. The particular section of the population from which the results are derived must be kept in view in all inquiries about natural increase.

Happily for society, those results mainly depend on the prevalence of marriage. The relative increase of both marriages and births in large towns was long ago fully explained [2] by the fact that numbers of young country people resort to populous districts of trade and manufacture for higher wages, and there marry. Many also, as Mr. Sargant has shown, resort to cities merely to be married, returning home or going elsewhere to live and breed. In fact, the marriage-rate of populous cities not being calculated on their real populations, cannot be correctly employed in any estimates of their progress or decay. These towns are continually recruiting their wasting populations from the surrounding counties, and draining off the best blood of the rural districts.

There is in cities almost always an excess of persons at the age 20–40. Dr. Morgan, of Manchester, in his interesting

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[1] There must be some mistake in these figures. The metropolitan births in the six or seven years ending 1844, were at the rate of 1 to 32 living; the Herefordshire births, 1 to 37.—*McCulloch's British Empire* vol. i. pp. 413, 414.

[2] 6th Ann. Rep. R. G., p. xx.

paper read at Sheffield,[1] takes a wider range for the reproductive period of life, namely, from the age of 15 to 45. He calculates from the census that in great towns the percentage of these persons is 49, and in the agricultural counties, taken collectively, only 42·5. It thus appears that the towns contain 6·5 per cent. more persons of marriageable age than are to be found in the rural districts. But, as yet, there is no evidence to prove that this larger proportion of procreating inhabitants produces a corresponding increase of the birth-rate;[2] and, henceforth, we must be allowed to modify conclusions drawn by the earlier statists of this century, as to the greater fecundity of people existing in crowded centres of filth, moral degradation, and physical degeneracy. Such persons are really in a state of enervation and anæmia, which

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[1] Soc. Sci. Trans. 1866, p. 427.

[2] The fallacy of Dr. Morgan's conclusions from his estimated ratio of births to marriages in Manchester and Hertfordshire, has been recently exposed by Mr. Sargant, in a local newspaper. (See also *Medical Press and Circular*, July 25, 1866.) Yet we cannot admit the validity of Mr. Sargant's very opposite deductions. (See *Statistical Journal*, March, 1865.) He makes it appear that the average proportion of births registered in ten years to each 100 married women—enumerated in 1861 as being from 20 to 45 years of age—is somewhat greater in large manufacturing towns, not being sea-ports, than in the whole of England, and much greater than in the metropolis and places of fashionable resort. But the census does not and cannot show the number of women, married and single, who had given birth to children in the preceding decennium. Multitudes of those mothers had ceased to exist before the census was taken; and the proportion of their deaths in manufacturing towns was considerably above that in the whole kingdom, and still more in excess of that in healthy districts. [Thus, the death-rate of all women, aged 20–45, in England and Wales (1851-60), was 10·27 per 1,000; in the Isle of Wight, only 9·71; but in Manchester and Salford together, it amounted to 12·20 per 1,000.] The greater mortality of mothers in the manufacturing districts, of course, makes the ratio of births to living women appear much higher than it really is; and there would be no difficulty in proving that women of the breeding period of life are not on the average so fertile in densely-peopled as in rural districts.

renders them less fit and able to propagate their species; and in these districts the excessive proportion of births to population depends on a rapid mortality and a shortened duration of adult lifetime. It is not that the births are too many, but that the murderous influences of town life quickly decimate the ranks of labour, to be again closed up by the thoughtless avidity of sanguine immigrants from more open districts. So much for the old statistical fallacy about the high fecundity of degraded populations.

[1875.—It would hardly be just to Dr. Letheby to omit all notice of his recent examination of the question of birth-rates as affecting death-rates. He believes that a high birth-rate involves generally a high death-rate. Dr. Farr and others conclude that a high death-rate causes generally a high birth-rate. That the facts are to a great extent *concurrent* may be fully admitted, without determining which is the cause and which the effect. By a certain collocation and grouping of the results in the registration counties of England, Dr. Letheby thinks to prove that the mortality *follows* the excess of births over deaths; but I find that if we arrange the counties according to the order of that excess, many strange exceptions to the supposed law occur. For instance, in the two counties in which that excess is the highest—Durham and Staffordshire—the death-rate is far from being the highest; and in Lancashire, where the death-rate is much the highest, the excess of births over deaths is the lowest but one. Other anomalies are frequent. On the whole, there is little proof that what is properly called 'sanitary condition' is seriously impaired by a high birth-rate. The English and Prussian nations show a greater excess of births over deaths than the other nations of Europe; and I cannot admit that the most vigorous peoples in the production of their species are in a lower sanitary condition than the rest.]

IX.—*Is there any numerical test of the Comparative Salubrity of Localities and the Vitality of different Groups of Populations, which may be more correctly employed, than their respective rates of mortality?*

Before any reply, however inconclusive, can be offered to this question, I must notice a proposal of the sanitary statists of Manchester for a certain modification of the death-rate. Vast numbers of the inhabitants of the large towns of England, especially in the North, are not born in those towns. They therefore represent vital forces derived from other districts and populations. A general death-rate, founded on returns which include the deaths of these immigrants, can convey no correct idea of the chances of life, actual or comparative, among the natives. Accordingly it has been proposed to limit the local returns, for purposes of comparison, to deaths occurring in the younger portion of the population, as being the least likely to be affected by migration.[1]

Dr. Morgan has published tables of population and mortality in towns and counties, which show that the mean of the reported death-rates of children under 15 years, in the metropolis and three other great towns, is 40·7 per 1,000, while the mean general death-rate of those cities is 26·1 per 1,000. In twenty-seven agricultural counties of England and in Wales, the mean of the children's death-rate is stated to be 21·9, the general death-rate averaging 19. Here, then, is a difference of fourteen between the two degrees of death-rate in towns, and a difference of less than three in the country. If the death-rates of persons under 15 years of age should appear, on extended observation, to be a tolerably correct test of

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[1] Drs. Ransom and Royston—*Numerical Tests of the Health of Towns.* 'Few comparatively leave their homes under fifteen years of age; consequently, up to this period of life, the population of any particular place may be looked upon as tolerably stationary.'—Dr. Morgan's *Deterioration of Race*, p. 16.

public health in town populations, we shall have another valid reason against quoting their *general* rates of mortality for this purpose; and the case against towns will become far stronger than was at one time supposed. But, important as such results may prove in the investigation of the causes of mortality, they cannot, without risk of error, be used as criteria of local salubrity and vitality. To many towns of another kind, children under 15 migrate in great numbers for the sake of education. In Brighton, Cheltenham, and some other watering places, the addition made to the population by the influx of children at the least fatal of all periods of life, is very considerable, varying from 2 to 5 per cent. It would be unfair to apply the proposed method of comparison to two towns, one educational and the other manufacturing, without a correction for 'exogenous' population at the age 10–15. But the main defect of this test is, that it relates only to a small portion of human existence, that which has the least immediate action upon the well-being of society. The duration of life in the productive and effective portion of the community is that which most seriously concerns the citizen, the local administrator, the social economist, the statesman. What are the chances of prolonging an active and useful life in this place? is the natural yet anxious question of many a hardworker in a crowded district. Wherever free choice is open to him, '*qui studet optatam cursu contingere metam*,' he will select the town in which he is most likely to run the longest race and to attain the desired goal of ease and competence in a green old age. It is the population above the age of 15 that determines the order, stability, intelligence, industry, and moral condition, not less than the sound progress, of society.

'The strength of a people does not depend on the absolute number of its population, but on the relative number of those who are of the age and strength for labour.'[1]

[1] Gen. San. Rep., p. 184.

To contrast the populations of England and the United States of America in this respect. Out of 10,000 persons, there were in England 5,025 between 15 and 50 years of age who had 3,610 children under 15. In America there were 4,789 persons living between 15 and 50, who had 4,371 children dependent on them; leaving in England 1,365 in every 10,000—in America only 840, who had obtained above 50 years' experience.

'The moral consequences of the predominance of the young and passionate in the American community are attested by observers to be such as have already been described in the General Sanitary Report as characteristic of those crowded, filthy, and badly administered districts in England, where the average duration of life is short, the proportion of the very young great, and the adult generation transient.'[1]

Again, there may be circumstances tending particularly to shorten the lives of the young, which have comparatively little, if any, effect upon the middle aged. It is needless to enlarge on these well-known influences. On all accounts, then, we ought not to be satisfied with any statistical comparisons of life and death which do not present a complete view of the whole period of existence, as well as of its several stages. Any estimates which serve to distract attention from the vital and sanitary statistics of the population at ages when productive industry and military efficiency are at their best, are of but questionable utility. The death-rate of the young may be extremely useful as corroborative testimony in sanitary inquiries; but it cannot be accepted as a decisive proof of the state of public health in any locality.

X.—*Is the* AVERAGE AGE AT DEATH *a better test of Vitality and Sanitary Condition than the rate of mortality?*

It is due to the distinguished author of the General Sanitary Report, 1842, to acknowledge the value of his original

[1] Mr. Chadwick, *Statistical Journal*, April, 1844, p. 27.

inquiries on this point, in different towns, districts, and classes of population. While he failed to establish the possibility of determining, simply by the mean age at death, the comparative 'prevalence and pressure of causes of disease and mortality' in districts differing widely in the ages and circumstances of their respective populations; his extensive researches and remarkable conclusions roused a spirit of critical inquiry among the leading statists of the day, and thus elicited a series of still more startling expositions of the errors involved in the uncorrected application of that test.

In this controversy, Dr. Farr led the opposing forces with all the resources and all the skill in handling them which might be expected from a master of the science, illustrating his objections to Mr. Chadwick's criterion, by several instances, both actual and hypothetical, each of which, though an extreme, was sufficient to reduce to an absurdity that method of estimating the health and vitality of any population. It was now made clear that the average duration of the lives of those who *die* in any place or country does not imply the average age of those who *live* there, any more than it means their average 'expectation of life.' The proportion of deaths to population, or the number out of which one dies annually (another mode of expressing a death-rate) is not, in fact, the same as the mean duration of life, either of the dying or of the living. Thus, paradoxical as it may seem to the uninitiated, 1 out of 41 may die annually, the mean age at death may be 29, the mean age of the living may be 26, and the mean expectation of life may be 37, in the same population at the same time. This was the case in the metropolis a quarter of a century ago. The difference between the mean age at death and the true mean duration of life was shown to depend in this country on the natural increase of population, and in certain populous districts especially on the continual introduction of a number of young lives.

Next in the field of controversy appeared Mr. Neison, the well-known actuary, supporting Dr. Farr by an analysis of the populations of the compared districts, and proving that a different 'distribution of population over the various periods of life,' or, as we should say, the various proportions of the living at each age in different districts, deprived of any statistical value all estimates of vitality founded on the mean age at death. By an elaborate series of tables he showed (1) that no two districts, whether in town or country,—no two cities, scarcely any two countries, contain the same proportion of inhabitants at corresponding periods of life; and (2) that this variation would of itself account for local differences in the average age at death. At the same time he damaged his allies by a flank attack upon the ordinary method of testing the sanitary state of districts, *i.e.*, by comparison of their respective death-rates.

Subsequently, in an able and exhaustive article,[1] Dr. Guy arranged the facts and methodized the arguments relating to numerical tests of sanitary condition.

The case against the 'mean age at death' rests upon the fact that it depends not so much on the prevalence of causes of sickness and mortality in any place or country as on the ages of its population. A few examples, cited in that discussion, deserve to be recalled to notice for the use of any future inquirers. (*a*) The populations of England and America were contrasted. Their general rates of mortality were the same —about $22\frac{1}{2}$ per 1,000—yet the former had 46 per cent. of its population, the latter 54 per cent., under 20 years of age; the mean age of the living in America was 22 years and 2 months; in England, 26 years and 7 months; and the average age at death varied accordingly, being only 20·4 years in America, and reaching 29·4 years in England. No

[1] Cyclop. Anatomy and Physiology, 'Vital Statistics.'

one *now* would venture to conclude from this fact that the Englishman had at birth an expectation of nine more years of life than his transatlantic cousin. (*b*) Three European countries were compared.[1] The mean age at death (omitting fractions) was 29 in England, 31 in Sweden, and 34 in France; but the expectation of life at birth was 41 in England, 39 in Sweden, and 40 in France; showing that the highest promise of life might co-exist with the lowest mean age at death. (*c*) The relative proportions of the people living at the several periods of age may vary greatly in successive epochs of time, in the same country. Thus, in England, according to the census of 1821, the persons living under 20 years of age were 49 per cent. of the whole population, and in 1841 they were only 46 per cent.; so the average age at death varied accordingly, being 25 years in 1821 and 29 years in 1841. These variations in the ages of the living population, said Dr. Guy, 'do so materially affect the mean age at death, as to rob it of its alleged value as a test or measure of the sanitary condition of nations.'

The populations of English counties, towns, and districts afford examples of diversity in composition, quite as remarkable as those of nations. Thus, it appears that the number of persons living below 20 years of age in Essex and Suffolk was 47 per cent., and in Staffordshire only 44; that the proportion returned for Leeds, Sheffield, and Birmingham was 46 or 47 per cent., but only 41 for Exeter, and 40 for London; and that the variation was extremest in the metropolitan districts, the per-centage of the population under 20 years of age being 47 in Bethnal Green, 36 in St. Giles, and only 31 in St. George's, Hanover Square. Comparing the proportion of children with that of young adults in the two districts most characteristic of East and West in the

[1] Dr. Farr, 6th Ann. Rep., p. 572.

metropolis, it appeared that, while there were 14·5 per cent. under 5 years and 8·9 per cent. between 20 and 25 years in Bethnal Green, the proportions were just reversed in St. George's West, children here being 8·6 per cent., and adults aged 20–25, 14·2 per cent.; and as the rate of mortality in infancy is always the highest, and that in early adult life almost the lowest, a remarkable difference in the mean age at death in these two districts was inevitable. The high average age at death in Greenwich would have placed it first in the order of salubrity and longevity, but for the awkward fact that a great number of old men lived in Greenwich Hospital, whose deaths raised the general average far beyond that which would have belonged to a native population.[1]

[1] The effects of this variety in the ages of the people of different districts were placed in a striking light, by supposing that the population of one city, or county, or district were transferred to another locality, and there exposed to the influences for good or evil, which bear on the lives of its actual inhabitants. Thus, had the population of Bethnal Green—the most short-lived of the metropolitan districts, according to Mr. Chadwick's mode of computation—been transferred to Kensington, the mean age at death in the aristocratic quarter would have been reduced from 32 to 27, and instead of enjoying six more years of life than at Bethnal Green, the average gain would have been only one year. In some cases the application of this corrective hypothesis actually reversed the relative position of the two populations in the pseudo-sanitary scale. Thus, the mean age at death in Bethnal Green being, as before said, nearly 26 years, and that of the Bloomsbury parishes 28 years, the latter, if their population had been of the same ages, would have returned only 24⅓ years at death, or 1½ less than that of Bethnal Green. Again, the mean age at death in Liverpool was less than 21 years; yet—without altering its specific mortality—if its population were transformed into one similarly constituted as to age with that of London, the figure would have been 25—a difference of only 4 years instead of 8½ years. At Sheffield, where the average age at death appeared to be 23·19, if there had been the same proportion of inhabitants at each age of life as in the metropolis, that average would have been raised to 28·14, or not quite a year less than in London itself. Most of the manufacturing towns, on this hypothesis, would have raised their age at death by four or five years, without improving their sanitary condition. On the other hand, the counties and the old cities of the realm showed a result precisely the reverse, their actual age at death always exceeding that of the metropolis, yet when

The error of employing the mean age at death as a test of sanitary condition became more glaring when applied to the different streets and quarters of any large towns, where emigration, immigration, and changing social circumstances, continually alter the composition of the living population. Thus, in one quarter of a populous town of recent growth may be found an excess of persons under middle age, attracted by some new factory, or the development of a promising branch of industry. These people marry early, carelessly occupy the nearest and meanest dwellings, supply the demand for employment of children who die off rapidly, so increasing abnormally the death-roll, and diminishing the mean age at death. While another quarter, not more scientifically defended against causes of sickness and mortality, may contain long-settled families, and established tradespeople, the elders of the city, the youths being drafted off continually, as from rural districts, to newer spheres of labour. Here an unusual proportion of deaths occur at advanced ages, increasing the mean age at death. Such opposite conditions enabled Dr. Farr to explain away Mr. Chadwick's conclusion from a return of the average age at death—13½ years in the undrained streets of Leicester, and 23½ years in the drained streets; for some of the former had been newly built and rapidly peopled by young immigrants, while the latter contained the older inhabitants, the natives of the town.

Enough has now been adduced, on good authority, to prove that the mean age at death cannot be accepted as a sole test of the general healthiness and vital force of a people. But it will be seen that the objections to this method are generally supported by extreme instances of obvious misapplication,

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corrected by an analysis of their living populations, the results were tolerably equal. Thus, Hereford boasted of a mean age at death of 38·42 years, or 9 above the metropolis, but by reducing the ages of the living to the same standard, that average sank to 30·54.

cases in which due corrections had not been made for the mean age of the living, the excess of population at certain periods of life, the increase of population, and changes in its composition by influx, efflux, or occupation. The refutation of an error did not deprive Mr. Chadwick's researches of all their practical value. He had ascertained the ages at death by the only reliable method—that is, by reference to the registers of mortality. Under his direction the Superintendent Registrar of each compared district had abstracted the ages of those who were buried in it, added up their years of life, and divided the sum by the number of deaths—a method far superior to any calculation of the ages at death by mathematical formulæ. Modifying his earlier conclusions, he afterwards[1] urged the importance of more useful and available returns of the ages of the living in every district, class, and occupation, as an indispensable corrective to the ages of the dying. He found that in what were considered ordinarily healthy districts, of stationary population, the mean age of the living was to that of the dying as about 3 to 4. As Mr. Chadwick expressed it—the line of mortality ran above the line of vitality. To take Herefordshire as an instance, the mean age at death was about 38½ years, but that of the living population, as nearly as could be made out from quinquennial returns, was about 28½ years. On the other hand, in districts of low sanitary condition and with shifting or increasing populations, the years of the dying were far fewer than the years of the living. The line of mortality descended below the line of vitality. For example, in Liverpool the age at death averaged 17 or 18 years, while the years of the living, calculated approximately from the census, averaged 25. Compared with Hereford, the ratios were just reversed.

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[1] See his paper on 'The Pressure and Progress of the Causes of Mortality.'—*Journal of the Statistical Society*, April, 1844.

We must, however, accept all such comparisons as subject to the objection now established, namely, that the ages of the living are often incorrectly stated to and by the enumerators of the census, and that being grouped in quinquennial periods, the number living at each year of life can only be estimated by a theoretical interpolation, whereas it ought, if possible, to be returned by actual enumeration. An annual census would afford the best means of rectifying mis-statements of ages. An excellent suggestion was made by Mr. Chadwick, that from data carefully recorded in each district, the actual duration of life, at the several periods of age, might be published locally, so as to furnish every inhabitant with a useful standard of comparison between his own and other districts, and between successive generations in the same place. Comparisons of this kind are next to impossible under existing arrangements. They can only be made by the very few who, in this busy land, can spare the time for wearisome, and not immediately profitable, inquiries, and who are willing to sacrifice themselves to the public good.

This controversy, so far from weakening the case of the 'sanitary' party, strengthened it; inasmuch as the elicited facts proved that in whatever degree the mean age at death might depend on the age of the living population, both are, in a badly-conditioned district, vastly below the normal averages observed in a healthy people; and if the ages of the living are apparently less affected by unsanitary conditions than the ages at death, this may be reasonably accounted for by the two facts, (1) that a high mortality spends itself chiefly upon little children, and (2) that crowds of young and healthy persons are for ever rushing in from country districts to fill up the fearful gaps made by the destructive battle of life in large towns.

XI.—*On Life Tables, National and Local, as Evidence of Sanitary Condition.*

(Manchester Statistical Society.)

A.—The English Life Tables.

1. Almost all recent writers on the subject seem to agree in the opinion that a Life Table, representing the expected duration of life at birth, and at each succeeding year of age, in any nation, district, group, or class of population, is the surest and safest test of its healthiness and vitality.

Without attempting even to sketch the history of these curious tables,[1] still less to discuss the mathematical methods of their construction, I wish to call attention to those recorded observations on which the tables are founded.

They are said to depend on two concurrent series of observations: the numbers and ages of the living, and the numbers and ages of the dying. Had these facts been always correctly observed and recorded, for a period long enough, and in a population sufficiently numerous and distinguishable from birth to death, to establish its own law of mortality, we might well accept the results as conclusive.

Dr. Farr, our highest authority on this subject, has, since 1841, constructed three Life Tables for England—monuments of profound learning and immense industry.

In the first of these tables his calculations were reduced to a radix or scale of 100,000 infants under one year of age, consisting of boys and girls in the same proportion as those born and *registered* in the two years 1840–41. This consti-

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[1] For information on this subject, see Dr. Farr's writings in the Reports of the Registrar-General, especially in Fifth and Sixth Annual Reports; also Mr. Milne's article 'Mortality' in the *Encyclopædia Britannica.*

tuted the hypothetical population which was to be traced through its successive annual decrements by death, until its final extinction in a century. The deaths, male and female, out of this 100,000, in the first year, were assumed to be in exact proportion to the total deaths of each sex registered at that age in 1841. The births were assumed to have occurred in the year of which January 1, 1841, was the middle point. The survivors became the 'population' from which the deaths registered as between one and two years of age in 1841 were again subtracted, in order to show the number of expected survivors on January 1, 1843.

For the first two years, therefore, the rate of mortality was not a *population* death-rate, but a *birth* death-rate. In fact, there was a dilemma. Had the radix of the table been taken to represent the census of population, instead of the register of births, the calculated ratio of mortality would have been higher, because a very large, though unascertained, number of the children living 'under one year of age' had not been so enumerated; and the error would have been greater than that which has resulted from a comparison of deaths and births, not including those births which escaped registration. The unavoidable inaccuracy of the calculation, whether based on the census or the birth registers, was frankly admitted by the author. A *true* basis being unattainable, the smaller error was wisely selected for the first two years of life; but for succeeding years—with the view of obtaining the probable survivors of the children born in 1840–41—it was thought better to adopt the census distribution of the people according to ages, and from it to estimate the proportion of the original 100,000, which was to constitute the hypothetical population living at each year of life; and it was again assumed that the males and females dying at each future year out of that hypothetical population would be in exact proportion to the total deaths of the

respective sexes registered at such age in the single year of the census.

After the first five years of life the mortality was reckoned for quinquennial periods, and the precise ages of the people within each quinquennium were corrected by a process of interpolation. Some such adjustment was indeed necessary, for in 1841 the Census Commissioners allowed persons of 32, 33, or 34 to call themselves 30, and so for other ages.

"Thus it was found that 6,633 men died at the age 20–25 out of 724,013 living; the mean age of those persons may be taken to be $22\frac{1}{2}$ years; we know the mortality therefore at that age, and can tell (?) how many of a given number, say 32,792, aged 22, will live a year—how many of the survivors of the 100,000 alive on January 1, 1843, will be alive on January 1, 1864. By repeating this calculation at every quinquennial period of life, it becomes evident that the force of mortality is regulated by a law (?), and may be expressed by regular curves (?) which can be derived from and enable us to correct the observations, where they are known to be erroneous from misstatements of age."[1]

2. The first doubtful assumption which strikes us in this remarkable passage is, that the mean age of all persons living at any quinquennium or decennium of age is the precise age equidistant from the extremes. But there is no evidence to show that the majority of those persons might not be nearer one extreme than the other. We see numerous instances of aberration from a regular arithmetical progression, in different groups of population, and especially in the earlier years of life, and at periods of age chiefly affected by migration.

It is hardly necessary to say, that if, during any of the years of the quarter-century since 1841 a greater or a less proportion of the population than that 'expected' did actually die at each age, the hypothesis on which the first Life Table was formed is unsupported by facts. That table

[1] Fifth Annual Report, Registrar-General, 1843, p. 22.

I repeat, represented a series of estimates, framed indeed by mathematical formulæ, but founded only on the facts of a single year, and on the particular composition and the vital forces of a pre-existent population. These 'expectations' of life might or might not be realized in the actual duration of the lives of children born in 1840–41. Influences for good or for harm, exceptional disturbances of vital force—dearth, famine, and pestilence on the one hand, commercial prosperity and favourable seasons on the other—occurring as they have occurred in the after lifetime of that generation, must have left a number of annual survivors differing more or less widely from the number expected to survive, according to the rate of mortality in 1841. Whether in fact the number which ought by theory to have survived did so survive at the end of each succeeding year of life, can never be learnt, because it is impossible to trace the actual lives and deaths of the children represented by the fundamental 100,000.

3. The objections naturally raised to an estimate of the duration of life in England—and with still greater force, as we shall see, to such estimates for towns and portions of the population—based solely on the rate of mortality for a single year, led to an extension of that basis in the second Life Table, which appeared in the Twelfth Annual Report of the Registrar-General. Here the deaths occurring in seven years, 1838–1844, were taken as the data from which to calculate the mortality at each period of life, the population of 1841 still remaining the pivot from which a hypothetical calculation was extended for the population in the three years preceding and the three following the year of enumeration. After the first fifteen years of life, the rate of mortality in decennial periods was found to furnish 'the most satisfactory basis for determining the series of fractions to express the probabilities of life'[1] at each year. Yet it can hardly be

[1] Appendix, p. ii.; Twelfth Annual Report, Registrar-General.

questioned that the longer the periods during which calculation is made to supersede observation, the greater is the risk of discrepancy between theory and fact.

4. The English Life Table, No. 3, has recently been published in a separate form. This very important work being not so accessible as the reports of the Registrar-General, and its author having been very explicit in his description of the principles and methods of its formation, I deem it advisable to repeat some of his definitions and introductory explanations, with occasional comments of my own; but I need hardly quote pages of symbols and equations which can interest few besides professional actuaries.

The new Life Table is calculated from the returns of two censuses, 1841 and 1851, and 6,470,720 deaths in 17 years—1838–1854.[1] Another ten years of observation is therefore added to the materials of the previous table, and the year 1846 is the middle of the term. This table, like its predecessors, is calculated from the *observed rates of mortality* at different ages in England and Wales. The rate of mortality expresses the relation between three elements,—(1) men living; (2) time; (3) men dying. The men living and the time expressed in years, multiplied into each other, produce the years of life with which the deaths are compared. A *year of life*, we are told, is the life-time unit, represented by one person living through a year, also by any number of persons living one at a time in continuous succession through a year. So also 525,949 persons, each living through one minute, are said 'to enjoy one year of life.' The years of life are determined by enumerating the population at certain periods of time, and thence deducing the numbers living through the time. Dr. Farr distinguishes the four following

[1] It has been assumed erroneously that this new table was based on the population of 1861; but the fact is, that *no* table founded on the last census has yet been published.

possible cases:—(1) The population is known or is assumed to be stationary; thus, a population of 10,000 living for two years yields 20,000 years of life; (2) the population increases by equal numbers in equal times, *i.e.* in arithmetical progression; thus, if a population is 4,000 at the beginning and 6,000 at the end of a period, the mean, 5,000, will also be the population in the midddle of the period, and multiplied by the intervening years, will give the *years of life;* (3) if the population fluctuates much, and frequent enumerations are made, the mean of each successive couple of enumerations, multiplied by the time expressed in years and fractions of a year, will give nearly the years of life; (4) the population of a country naturally increases in equal proportions in equal times, or in geometrical progression, for this is the necessary result if the increase also increases; and if the increase be small, or if the mean of several terms be taken, the result differs little from the results under case 2.

In dealing with the English population determined for the middle of the years 1841 and 1851 from two enumerations, the population was carried back to the beginning of the year 1838, and forward to the end of the year 1854, by a mathematical process. 'The years of life-time, enjoyed by males and females during the 17 years, were deduced (?) separately for each of twelve ages;' and this also by a series of equations and interpolations.

The true mean population in geometrical increase is said to be *less* than the mean of the numbers living at the beginning and end, *more* than the number living in the middle of the period. Therefore, to divide the (average) annual deaths by the arithmetical mean of the extremes would understate the mortality, which varies inversely as the population. For the same reason, to divide by the population assumed to be living in the middle of the period would overstate the death-rate. *The shorter the period, the less is the error.* The mean of

the populations existing at two points of time (within the period) equidistant from the extremes—as 1841 and 1851—is near the true mean population living through the 17 years. Thus, in calculating the mean number of males of the age 15–25, it appeared that—

(a) 1,591,550 = true mean *on the hypothesis* that the population increased in geometrical progression, at an uniform rate;

(b) 1,591,618 = arithmetical mean of the numbers living in 1841 and 1851;

(c) 1,595,424 = arithmetical mean of the numbers living at the beginning and end of the 17 years;

(d) 1,589,606 = number living in the middle of the period.

But it is to be noticed that the numbers said to be living at the beginning and end, or in the middle of this period of 17 years (c) and (d), are merely estimated, not counted, and are therefore not facts ascertained.

After one stiff pull at the grammar of Life Tables, we may pause to take breath and courage for another, comforted by the assurance, which the preceding figures are intended to give us, that—in the present condition of our national statistics of life and death—the easily obtained arithmetical mean between any two consecutive decennial enumerations of a people expresses with sufficient accuracy its mean population for a longer period of years, the middle of which shall coincide with the middle of such decennium. But it is difficult to escape the inference, which again and again suggests itself—in reflecting on these methods of calculating probabilities of life—that an expenditure of much ingenious labour and a risk of many questionable assumptions might be saved by counting up the population once a year. When we are advised, as in the preceding case 3, to take the mean of each successive couple of enumerations, if the intervals are *short*—or, as in the case of this Life Table, to take the

mean of two enumerations equidistant from the extremes, if the period of observation be *long*—it is almost impossible to doubt that there is too much of theory, too little basis of fact, in the whole method of computation, and that we should be much safer and surer with an annual census, which would generally supersede the necessity of estimating a mean, or any intermediate stage between two enumerations.

5. To return to Dr. Farr's preliminary explanations. The rate of mortality, we are again informed, is determined for the several periods of life by dividing the deaths registered at each age by the contemporaneous years of life out of which they occur, deduced from the population of a corresponding age enumerated at the census. Here, as in the previous Life Tables, it is assumed that the children born within the period of observation will live as long as, and no longer than, those who were born at intervals during the century preceding that period, and who made up the living population at the census. All the diverse conditions and circumstances—physical, moral, political, and social—which variously affected the duration of life in England for a long antecedent series of years (or the equivalents of those conditions) were assumed to exist and to act with precisely equal force upon the children born in 1838–1854, and constituting so large a portion of the present generation.

6. The new Life Table consists of three parts,—the first for 'persons,' and consisting of such proportions at each age of the two sexes as are produced by the births; the second for males; the third for females. The basis of Part I. (for persons) is 1,000,000 children born alive; and as boys and girls were said to be born in England during the period of observation in the proportion of 511,745 boys to 488,255 girls, these numbers were made respectively the bases of Parts II. and III.; but the defective registration of births makes these figures of doubtful value. In the synoptical table (p. 24) the numbers of males and females living and dying at each

year of age are given, it is said, as they would exist in a population under the same law of birth and mortality, which is found by direct observation to prevail in England and Wales, *undisturbed by emigration, by excess of births over deaths, or by any other element of that kind.*

Now, as these conditions are never practically fulfilled in the English population, or in any portion of it, the hypothesis, however correctly applied to a calculation of probabilities, is of no practical value in the comparison of facts by the sanitary statist. It is, moreover, difficult to conceive how that which is here termed the law of mortality, and which I should rather call a series of calculated results from a limited record of events, can possibly be 'undisturbed by emigration, by excess of births over deaths,' &c.; for these certainly have always affected—though by no means uniformly or according to any known law—the numbers, ages, births, and deaths of the English population; and their influences are unquestionable, if not calculable, upon every census and every register.

In addition to the principal computation of this great work, a vast amount of valuable information, arranged too in a convenient form for reference, is presented in a series of tables, *e.g.* the mortality of males and females at different ages, the mean after-lifetime, the mean age at death,[1] and all these calculated for both sexes at all ages.

We learn that the expected duration of life at birth was 39·91 years for males, and 41·85 years for females, that the mean after-lifetime of males and females at all ages was 32·1, and that this would also be the 'average age of the living' were the population stationary; but the excess of young people reduced the age of the nation to 26·4 in 1851 *i.e.* by 5·7 years, or *by half the difference between the*

[1] The best definitions of these and other terms in use by writers on vital statistics, as the *vie moyenne*, the *vie probable*, the specific intensity of life, are to be found in the article 'Vital Statistics' (before referred to) in the *Cyclopædia of Anatomy and Physiology*.

mean age at death 29·4, *and the mean expectation of life*, 40·9. The whole of that difference, 11·5 years, is said to be the result of the introduction of an excess of young lives; as, in addition to the 360,631 births to balance the deaths annually, 191,068 (making 571,699 children in the whole) were born annually and thrown upon the population.

7. Here, again, I must remark, that did the elementary facts on which these tables are so beautifully calculated deserve implicit confidence, the conclusions would be of the highest value. Dr. Farr himself confesses that, in a population which is disturbed by emigration, by immigration, by varying excesses of births over deaths, or of deaths over births, or by pestilence—and these are constant causes of disturbance in town populations—*the mean age of the dying can be determined only by the registers.* This doubtless is the true solution of the difficulty, and it indicates the source of a true answer to a question which has been recently asked, 'Is there any numerical test of the comparative salubrity of localities and the vitality of different groups of population, which may be more correctly employed than their respective rates of mortality?'

The superiority of the new Life Table consists mainly in its embracing a considerably extended period of observation, the elementary units being proportionately more numerous, and therefore the results less exceptional.

8. It may be as well here to give, in a tabular form, the comparative expectation of life, from the *three English Life Tables.*

Expected Duration of Life by the English Tables.	Ages (Males).							
	0	10	20	30	40	50	60	70
1841 . . No. 1.	40·17	47·08	39·88	33·13	26·57	20·03	13·59	8·52
1838–1844 No. 2.	40·36	47·47	39·99	33·21	26·46	19·87	13·60	8·55
1838–1854 No. 3.	39·91	47·05	39·48	32·76	26·06	19·54	13·53	8·45

This comparison shows that the probabilities of after-lifetime at every age have decreased between 1841 and the last period of observation, the middle year of which was 1846. This decrease is greatest at the ages 20 to 50, the most active and motive period of existence. We shall anxiously watch for a fourth Life Table, based either on a period of observation extended to 1864, with the census of 1851 at or about the middle point; or on a shorter and later period, *e.g.* 1855–1867, with the census of 1861 as its population basis. If the late apparent fall of the vital barometer continues in England, notwithstanding 'sanitary reform,' we must cast about for some clue to the mystery.

B.—District or Local Life Tables.

1. If there are disagreeable uncertainties and probabilities of error in the records on which the English Life Tables are founded; if, owing to defective data, they are not perfect *indices* of the longevity of the English people, their fallacies shrink into insignificance when compared with those of similar calculations (also called Life Tables) for particular towns and districts.

In his Fifth Annual Report the Registrar-General published the elements of tables for the Metropolis, Surrey, and Liverpool; and, in the Seventh, a more complete series for Manchester. A very clear idea of the comparative loss of life, from birth to the longest period of existence in each population, would be conveyed by some curiously constructed diagrams in the former volume, if the lives and deaths represented in each parallelogram really belonged to the community described; but wherever the movements of population from place to place are as free and unrestricted as they have now become between the various districts and towns of England, it is almost impossible to determine the specific intensity of life in any particular group of individuals,

because the composition and colouring of each group is for ever shifting, as in a kaleidoscope. The same picture of the living and writhing mass is scarcely ever twice presented to the eye. The various degrees of reproductiveness in different portions of the population, and especially the continual migration of young adults from the rural districts to cities, cause extreme diversity in the proportions of the living and dying at almost every age. These oscillations of human life in different localities compensate each other to a great degree when the whole population of England is observed; but they stand out in full force when the facts recorded in each district are made the basis of a separate calculation.

A reference to the 'birth-places' of the people in the census will show that very large though very different proportions of the great town populations were born in *other* counties of the kingdom; but, unfortunately, the census does not distinguish the natives of any provincial town from those of *its own* county. The *living* population of a place does not, therefore, in any way represent its *native* population. In like manner, the mortuary registers of all districts include deaths of persons who were born elsewhere. Multitudes die in the country who lived, if they were not born, in towns. The physiological and social differences which characterize the people of different districts—people begotten, born, bred, fed, worked, and housed under every conceivable variety of circumstance, condition, and hereditary influence—might indeed produce clear and distinctive results, for the use of the statist and the physician, if every such group could be traced from birth to death as a separate community; but since, in the course of life, the natives of probably every district are more or less dispersed, and are reckoned in the census among other communities differing in various particulars from those of their extraction, *no* local life-tables, constructed upon the census and registers in their present

form, can represent truly—few even approximately—the duration or expectation of life appertaining to the indigenous populations. For example, to show how differently the least fatal and most vigorous vicenniad of life—age 15 to 35—must affect a local Life Table, it appears that in Liverpool the proportion of these young adults to the whole population, in 1841, was nearly 42 per cent.; in Manchester, 39·2; in London, nearly 40 per cent., though in 1860 the London ratio approximated nearer to that of the country. But in Surrey it was only 34·3, and in sixty-three 'healthy districts' (of which more hereafter) the proportion sank to less than 32 per cent.

We have seen that this difference, averaging 8 per cent. at that period of life, is caused mainly by the town influx of young and healthy people born in other districts. But to what extent this immigration affects the composition of town communities is only known exactly in London; for, although under 'birth-places' in the census we can find how many of the inhabitants of each town and district were natives of other counties, the number born in healthy districts in the same county is not stated. Thus we know not how far the population of Birmingham was recruited from Warwickshire, or how many inhabitants of Liverpool and Manchester sprang from a once stalwart ancestry in the agricultural districts of Lancashire. We may, however, be quite sure that the rates of mortality, recorded in the so-called Liverpool and Manchester Life Tables, for the adult and productive period of life, do not nearly represent the mortality of the native communities.

Again, the death-roll, on which a local Life Table is founded, is as unreliable as its population element; for the continual exodus from country villages leaves the very young and the very old to die at home, while it credits other districts—populous towns especially—with the deaths of enterprizing immigrants.

2. There are 63 districts in England in which the reported mortality did not exceed 17 per 1,000. These, under the name of 'the healthy districts,' and formed into one group, have been employed by Dr. Farr as the population basis of a new Life Table, or rather series of tables, published in a scientific paper read before the Royal Society.[1] In this essay the learned author minutely describes improved processes of interpolation and proposes some new formulæ. But our business is with the elementary facts of these tables, which, although founded on only five years of observation (1849–53) and one census (1851), are much less liable to exception, as far as population movements are concerned, than the vital statistics of great towns. Nevertheless, on referring to the census of the ten selected districts of Sussex, it appears that nearly 24 per cent. of the adults were born out of that county, and therefore to that extent at least, the calculated duration of life is a doubtful index of the vital force of the Sussex people. Moreover, the reported mortality of these 'healthy districts' does not show the deaths of their indigenous populations, for the natural increase resulting from the great excess of births over deaths has disappeared. It has been consumed in towns, and is reckoned in their mortality. The flower of the population has been sent to feed the furnace of life in manufacture and commerce. Under the First Napoleon, the young men of France were called *food for the cannon*. Under the present employments and movements and concentrations of the people of England, young men (and women too) of the rural districts are drafted off as *food for the steam-engine;* and those who are spared by the factory and workplace are destroyed by the overcrowded dwelling, the impure air of the city, and the habits and vices of town life. Without a continual

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[1] Philosophical Transactions, Vol. 149, Part II.

inpouring of country people at the healthiest ages, the great town populations would rapidly waste away, by a natural or rather unnatural decrease.

3. Thus cursorily have I examined the grounds on which sanitary controversialists require us to adopt some numerical test of vital force and sanitary condition in a country, community, or district, whether that test be the ratio of deaths to population, or the ratio of deaths to births, or the ratio of births to population, or the average age at death, or the expected duration of life and mean lifetime, as shown in Life Tables. With inaccurate data, incomplete records of ill-defined facts, and other similar sources of error, these various methods (each and all) are open to valid objections. The same defects of data, which vitiate local rates of mortality, vitiate also the life tables deduced from them. The more complex and refined the calculations, the more offensively do the elementary errors obtrude themselves.

Generalization, an essential process in the induction of laws from numerous observations of facts and events, may be employed so rapidly, or on so insufficient a number of particulars, as rather to pervert truth than to aid in its discovery. It will be time enough to speak of the English laws of population and mortality when the ultimate elements of calculation have been verified during long periods of observation. No series of equations, no logarithmic curves of mortality, no theoretical interpolations, will supply the want of full and accurate record of facts. We grant that facts are stubborn things, and apt to behave without the grace and complaisance of theories. Nevertheless, we had better accept them in this matter with all their faults, verifying, correcting, and patiently accumulating the returns, until the mass of genuine material suffices for a profitable analysis and for a true induction of 'laws' of life and death.

We ought to be enabled, by official records, to trace each

life from its commencement to its conclusion, connecting the registry of the birth with that of the death. The mortuary record ought to contain, as far as these particulars can be ascertained, the previous dwelling places of the deceased, his class, profession, or occupation, and civil condition, beside the precise place of death and length of residence in that place before death.[1]

To conclude this part of my subject. Even under present circumstances, the mean age at death of the natives of a district, town, county, or nation would be a most valuable item of information; but, when supplemented and checked by the other particulars above mentioned, it would be almost a perfect numerical test of the vital force and sanitary state of a given population. I am therefore justified in calling for at least one addition to every registry of death, namely, the birth-place of the deceased. This amendment might be immediately adopted. Others would follow. By degrees, and as the registration of births and deaths improves, and as sanitary organization advances, the number of birth-places 'not specified' would steadily diminish; and from the commencement of the change there would be a respectable proportion of returns for purposes of calculation.

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[1] It is most satisfactory to find that Dr. Farr, in his last official letter to the Registrar-General (27th Annual Report, pp. 176, 191), a most interesting and important document, has sanctioned so large a portion of the recommendations which have been repeatedly urged by advocates of reform in the registration system.

FALLACIES OF VITAL AND SANITARY STATISTICS.

[Chapter the Third.]

ON CERTAIN SPECIAL FALLACIES IN LOCAL RATES OF MORTALITY,

Arising from defective information—

(I.) *As to the Influence of Class and Occupation;*
(II.) *As to Movements of Population;*
(III.) *As to Public Institutions;*
With some remarks on Hospital Mortality.

(Manchester Statistical Society, read November 15th, 1871.)

1. In a series of contributions to the late *Social Science Review* (1866), I called attention to wide variations in the general rates of mortality in different towns and districts, variations caused not by their different degrees of natural salubrity, or by differences in the efficiency of their sanitary regulations, but by the different composition of their respective populations.

Thus, the ratio of the reported dying and the reported living was shown to vary (*a*) according to the varying proportion of the sexes, (*b*) according to the number of the population living at each age, (*c*) according to the mode of taking the census and of estimating the population during the intervals of the decennial enumerations, and (*d*) as to infant mortality—according to the varying ratios of reported births. In those articles, and afterwards in a paper read before this Society, I examined 'the grounds on which sanitary controversialists require us to adopt some numerical test of vital force and sanitary condition in a country, community, or district'—whether that test be the calculated ratio of deaths to population, or of deaths to births, or of births to population, or the reported average age at death,

or the expected duration of life and the mean lifetime, as shown in Life Tables; and I showed that each of these tests was liable to error.

2. It seems to me desirable now to point out other main sources of fallacy in general death-rates; and I would notice, first, the effect of CLASS and OCCUPATION on these calculations.

To classify the individuals of a community so complex as that of Great Britain, upon any social theory, would be but a waste of statistical ingenuity, unless it were to result in some measure of practical utility. Yet, in truth, there are questions of high importance to social science, which involve the necessity of grouping the people according to some well-known and easily-distinguishable conditions.

3. The Census of 1851 recorded, more minutely and accurately than any preceding Census, the numbers maintained by each occupation, trade, and profession, and their distribution in districts and large towns throughout the country. The information thus afforded might well be made the foundation of some future inquiry into industry and the organization of labour. The principles of the classification of 1851 were scientific, and the arrangement depended not only on the common name of each occupation and calling, but also on the objects and materials to which it applied, the methods by which it worked, and the means or tools which it employed, as well as the products it created.

The seventeen Classes (Census 1851, II. Rep. pp. lxxxiii.–c.), which need not be here described, became, with certain unimportant modifications, the eighteen *Orders* of the Census of 1861, comprehending eighty-six sub-orders or genera, under which may be found every species, almost every variety, of calling and industry, the 'Orders' themselves being ultimately grouped into six great Classes, namely, professional, domestic, commercial, agricultural, industrial, indefinite and

non-productive. The distribution of the persons following each occupation, according to counties and registration districts, and in the principal towns of each division, as also the Summary Tables (82–103), convey a vast amount of useful information respecting the composition of our chief groups of population.

4. But, assuming that the effects of occupation upon health and life could be determined by comparing the population, as classified in the Census, with the births and deaths registered in every description of industry, we find no direct information on the latter point in the Annual Reports of the Registrar-General. Nevertheless, it is the fact that in every registry of death, 'rank or profession,' including occupation, is or ought to be returned; but this valuable information appears to be never officially utilized in or for the locality. You may find in the Census the number of butchers, or shoemakers, or persons employed in cotton manufacture, in any district, but you search the Annual Register in vain for the number of persons in each occupation who have died in that district in any year. Yet, as we see, the information exists in the archives of the department, in stately reserve, only requiring a medical officer of registration in the district to draw it forth and employ it for the public benefit. Of course, the central publication could not, in this matter any more than in others, supply the want of complete local reports, unless it reached a size too unwieldy for general use and too expensive for large circulation. Nevertheless, it is obviously essential to any complete system of vital and sanitary statistics, that the specific mortality of those engaged in every branch of industry be accurately ascertained, so that everywhere its effects upon life might be considered in relation to the influences of sex, age, locality, &c.

Accordingly some attempt was made in the very valuable Supplement to the 25th Annual Report of the Registrar-

General, to supply this defect in the published register. In that supplement, the annual mortality of males, in the better defined and more remarkable occupations, at different periods of age above 15, is given for the two years 1860–1, for all England (pp. xxxiv. and xxxv.). By comparing these tables with the total population employed in the several occupations, the rate of mortality in each, for that *biennium*, may of course be ascertained for special purposes. But when an inquirer desires to get at the facts in any locality, he has to collect them, at his own cost or trouble, from the *original register of the district*, and then to compare them with the numbers of each occupation in the Census.[1]

Dr. Headlam Greenhow, in his remarkable essay above referred to (p. 55) on the differing prevalence of certain diseases in different districts of England and Wales, the first investigation of the kind ever made in this country, estimated the comparative salubrity or insalubrity of a place by its rate of mortality. Since that time we have learned that these death-rates are neither correct nor safe indications of the healthiness of any district. They can hardly now be ac-

[1] There are nevertheless specious tables in the Supplement referred to (p. 439), leading the hopeful student to fancy he may attain his object. There we see the male deaths in each of twelve periods of age, and in more than 400 occupations (p. 27) for each of the eleven divisions of England. Nay more, the same facts are subsequently given for the whole of 80 town districts, and even for a small group of towns selected from each division (p. 514), yet nowhere for each of the towns; so that for the purpose of any strictly local inquiry one is finally baffled. The result is the more disappointing, because the Census gives the number of persons engaged in the principal occupations in 79 important towns. 'Surely,' says the inquirer, 'these 79 are of the 80 in the Registrar-General's Supplement; so I shall be near enough to the mark.' Nothing of the sort; the two lists are quite different, and when the same town appears in both, the figure in the Census relates to the *municipality*, that in the Report to the *registration district* to which the town belongs. So he turns from the pretentious figures in vexation and disgust, on finding that all inquiry as to the death-rate in each occupation must end at the registration districts.

cepted 'as a means of measuring the condition of the public health.' And Dr. Greenhow himself admitted that they 'afford no direct information as to the causes' of those attacks which end fatally.

Among the circumstances comprised in his inquiry, embracing the ratio of pauperism and the density of population in a place, the most important in his estimation was the nature of the chief industry of its inhabitants; and therefore, after grouping the more fatal diseases under ten heads, he proceeded to compare the death-rate from every such class of disease, in districts distinguished by different *industrial employments*. It is not my purpose to follow his inquiries and conclusions. I refer to them not merely on account of their originality and high value, but to show that Dr. Greenhow, in this inquiry, had not the advantage of that detailed information, the want of which we still complain of. Had these facts been at his command, his conclusions would have been incomparably more certain and valuable; and many anomalies for which, like a true philosopher, he acknowledges his inability to account, would have been explained.[1] He thought that a source of embarrassment arising from the mixture of industrial pursuits in provinces and counties would be much diminished when smaller districts, of more homogeneous population, were compared with each other (p. 37).

But the real defect was that he could not, from any published records, show the actual deaths, much less the diseases, of persons belonging to defined occupations. Even the Supplement to the Twenty-fifth Report had not then appeared. The utmost Dr. Greenhow could do was to classify districts

[1] 'The facts,' as he says, 'would probably be much stronger if the mortality were more closely analyzed, for the death losses now described are the death-rates of persons of all ages and of every station and occupation' (p. 35).

according to what might seem to be the distinctive industry of each, and to show the co-existence of that industry with a high death-rate from certain alleged 'causes.' Despite the manifold sources of error inevitable in such a method, his tables from xxiii. to liii. (pp. 49–82) take first rank among contributions to the statistics of life and occupation.

6. I assumed, for the sake of argument, that the effect of occupation upon the health of the individuals employed might be ascertained by comparing the number of persons in any place or country, engaged in a particular line of industry, with the rate of mortality and reproduction and with the average duration of life among the persons so occupied. Every statistician knows, however, that an assumption of this kind might lead to many errors, noticed in earlier papers of this series.

But my principal object now is to show that the 'occupations,' as returned in the decennial Census, and as recorded in the unpublished register of deaths, do not correctly express the conditions of CLASS, which may have as much to do with mortality and disease as OCCUPATION itself.

Mr. Chadwick, who directed the sanitary movement in 1842, asserted with truth that 'very dangerous errors arise from statistical returns . . . . made up from gross returns of the mortality prevalent among large classes *who differ widely in their circumstances*.' In analyzing the returns which he procured from a number of districts—town and country—he ascertained the number of deaths in each district, of (i.) Gentry and professional persons and their families; (ii.) Farmers, tradesmen, and others similarly circumstanced, and their families; (iii.) Labourers, artizans, and their families, servants, &c.; and (iv.) Paupers, &c. Setting aside all differences of occupation, he viewed the self-supporting portion of society as consisting of three great classes, distinguished chiefly by apparent differences in

their means of subsistence and in their style or mode of living. (Perhaps the six classes of the Census of 1861 also represent the same broad facts, but not so distinctly.) Calculating the average age of those who died in each of his three classes, Mr. Chadwick thought he had determined their comparative sanitary condition.

To what extent and with what limitations the average age at death in any district may be taken as an approximate test of its health and vitality need not again be considered in this place. The fallacy of Mr. Chadwick's argument was exposed, as I have before shown,[1] by Farr, Neison, and Guy. But whatever may be the errors of that method of comparison, when applied to communities or to classes of the same community, in which the proportions of population living at different ages or periods of life differ widely, or to districts where migration and social changes continually alter the composition of the living masses, the calculation of the average age at death has a distinct advantage when comparing old settlements and long-peopled territories.

7. To revert to the Census. Only in certain occupations does this show the distinction of class—a distinction which I assert to be necessary to any sound inference. To take a few salient examples:—

Among *Domestic Servants* the marked contrast, in habits of living and in the cost of maintenance, between the many servants of all kinds employed by the upper ten thousand and the servant of all-work to the lower and middle classes —involving enormous differences in diet, accommodation, and clothing—renders vague and uncertain any hygienic conclusions drawn from the whole number of that occupation returned in the Census.

Again, take 'Order x., 7, *Watch and Clock Makers*.' No distinction is made between the employer and the employed,

[1] Soc. Sci. Review, August, 1866.

between a Vulliamy and a squalid case-polisher of Clerkenwell. The 'occupation' includes men moving in the higher circles of society and enjoying every comfort of life, as well as artizans dragging on a weary existence in crowded and impure tenements in densely-peopled town districts.

There are other occupations in the same order equally inconclusive as to class; such as *Shipbuilders* (13), *Wheelwrights* (11), *Carpenters and Cabinet Makers* (14 and 15), &c. So especially, in 'Order xi.,' *Manufacturers of Woollen Cloth*, and *Worsted*, *Silk*, and *Cotton*, include both masters and men; as do *Drapers*, *Tailors*, *Hatters*, and *Shoemakers*.

In the above and numerous other branches of industry it would be impossible to show the influence of different degrees of competency, *i.e.*, of differences in the mode and habit of living, from the Census and Register, even were the facts in the latter published.

The effects of occupation on health have been treated statistically with primary reference to the sanitary condition of the *workers* employed in the several trades and manufactures. But I do not ignore the other question, viz., the effect of communities of workpeople, of factories, and of commercial processes upon the *neighbourhoods* in which these processes are carried on. The manner in which commercial and chemical establishments affect the vital statistics of districts and towns, may be viewed in connection with and may cause the like disturbance of numerical results, as hospitals, prisons, and other public institutions, including densely populated blocks of lodging-houses, as well as emanations from mineral and animal works.

The celebrated French code regulating *Établissements Insalubres* was compiled to protect the *public* against nuisances, incommodities, and offensive exhalations, and did not touch the health of the workers.

The distinction between the effect of occupation upon the

persons employed and upon the surrounding populations was well argued by Dr. Sutherland, Dr. Ballard, and Dr. Guy at the fourth International Congress in London.

Both questions require scientific examination and report, with classification of facts, before any statistical comparison of results can be fairly made for sanitary purposes. Moreover, it must not be assumed that certain occupations are necessarily insalubrious either to the workers or to the districts, until such scientific investigations are tolerably complete and satisfactory.

In the interesting discussions which took place at the said Statistical Congress, this question of class and occupation was brought forward by Mr. Chadwick, supported by Dr. Ballard, with considerations and suggestions which I think are unanswerable. It was shown that the same class, especially in crowded towns, may include every variety of occupation, in the same condition of habitation.

Occupations therefore, *per se*, constitute a most delusive distinction for the purpose of determining sanitary condition.

These gentlemen also showed the further difficulty of making the necessary distinction between the superior and the inferior tradesman, the labourer and the skilled artizan.

After all, the kind of habitation seems to be the simplest and the most easily distinguishable difference for the purpose of classification. So Dr. Ballard wisely fell back upon the kind of residence.

8. It seems to me desirable to record different conditions of life, in the authorized statistical publications of the kingdom, by some obvious and easily registered distinction.

The *Income Tax* has been suggested; but this may not last for ever; nor does the amount paid by each person at all indicate his actual degree of competency. So as regards the payment of local *Rates;* however the areas and incidence of local taxation may be amended by Parliament, it must

remain open to the same objection; *e.g.*, a comparatively poor man, badly fed, clothed, and lodged, may be engaged in an occupation which obliges him to pay much higher rates than his wealthy neighbour, who indeed may avoid payment of rates altogether by living in furnished apartments.

The RENT OF THE DWELLING is, I believe, the nearest ascertainable test or index of competency or material prosperity. Houses, or parts of houses rented separately, might be classed according to amount of rental: for example:—

Class A. might include dwellings occupied by persons unable to pay rates; *i.e.*, the lowest stratum of the labouring classes, including out-door paupers.

B. Houses rated under 10*l.* and accommodating labourers, artizans, and the smallest traders, *i.e.*, what are generally called 'the working classes.'

C. Houses rated from 10*l.* to 20*l.*, their occupiers being generally high-waged artizans, clerks, tradespeople, and small annuitants.

D. Those rated from 20*l.* to 50*l.*, accommodating the great majority of tradespeople and small farmers, as well as many professional and independent persons in the provincial districts.

E. Those rated from 50*l.* to 100*l.*, in which the upper middle classes are mostly to be found.

F. Those rated at upwards of 100*l.*, inhabited almost exclusively by what are called the higher classes.

In estimating the rent of furnished houses and apartments, a deduction might be made on a general principle, so that each class might include furnished, as well as unfurnished, apartments.

Not only ought every occupier to be required to make a return of the *class* of his dwelling to the enumerator of the Census, but every registry of death, besides stating the exact locality of the death (at present imperfectly returned), and the occupation, rank, or profession of the deceased, should also specify the class of house or dwelling.

A record of these facts in the Census and Register would be of immense utility in the investigation of many social

questions, involving the statistics of industry and education, as well as of health. The kind of dwelling, taken in connection with the occupation, would decide and correct uncertain results, which now belong to what Mr. Sargant calls 'conjectural' statistics. In sanitary inquiries the information as to social condition would be complete. The influences of locality, of occupation and habits, of dwellings, and of circumstances—hitherto assumed on utterly insufficient data—would be accurately determined.

Possibly the effect of class, *per se*, may be smaller than appears on the face of such returns as Mr. Chadwick's. But in the careless, off-hand manner in which the general death-rates of towns, districts, and institutions are now commonly quoted, the influence of class is ignored, and local sanitary conditions are too often accused, without acknowledging the different composition of the populations compared.

Mr. Sargant[1] has proved the injustice of comparing the death-rates of Birmingham and London without reckoning the 'specific mortality' according to class and age. He estimated a reduction of $1\frac{1}{2}$ per 1,000 in the death-rate of Birmingham, supposing that its proportion of the affluent and educated were the same as that of London. This is a remarkable instance, for Birmingham possesses great natural advantages—fine position, soil, elevation, undulatory surface—all conducive to the health and longevity of its inhabitants. Yet the sickness and mortality caused by badly-regulated employments—to say nothing of other removable causes of disease—place it on a level, *quâ* death-rate, with districts clearly marked by natural features as insalubrious. And I refer to it, as I did to Dr. Greenhow's calculations, in illustration of the worthlessness, statistically speaking, of

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[1] On Certain Defects and Results of the Registrar-General's Reports.—*Journal of the Statistical Society of London*, June, 1864, p. 208.

the death-rate of any district as a test of its salubrity and longevity, until the death roll has been analyzed and the proportions of the living and dying in each of the classes and occupations of that district determined.

II. In the next place I have to notice the misleading variations to which local death-rates are subject from the INFLUX AND EFFLUX OF POPULATION.

In my paper on LIFE TABLES, under the head 'B. *District or Local Life Tables*,' I called attention to the unavoidable uncertainty of calculations based on the supposition that the inhabitants of a place were permanently resident, when in fact they might be constantly coming and going; so that I need now do little more than adduce a few illustrations and remarks in support of the argument.

The death-rate, as now calculated on the total number estimated or enumerated of the existing population, cannot be relied on as a test of vital force, unless (*a*) the number of immigrants and their average term of residence should balance the number of emigrants and their average term of absence, and unless (*b*) the proportion of the sexes living at each age, and the state of health and liabilities to disease, were the same among emigrants as among immigrants.

Now, it need hardly be said that such conditions are unattainable; for even were it possible, by the aid of the police, permanently employed as enumerators, to keep a distinct record of migrants, as is done in some European cities,[1] and were the deaths occurring among the immigrants deducted from the deaths of the constant inhabitants, the local death-rate would still be open to criticism, unless the after life-time of those who had emigrated from the locality in question could be ascertained and allowed for.

All such calculations based on conjecture, however plausible,

[1] See note on Frankfort, p. 56.

would be worthless; and to determine the precise facts by actual enumeration and inquisitorial inspection would be almost impossible, if worth the cost. Doubtless much might be done by an annual Census, as well as by a scientific health officer, in every first-class town or wide area, well versed in vital statistics, and competent to make or direct these researches and calculations. But death-rate comparisons, as they are now made, between the busy commercial and manufacturing towns and the old cities and quiet country towns of England are, for the above reasons, wholly inadmissible, and lead to most extravagant conclusions.

Dr. Ransome and Mr. Royston have proposed to correct these errors, which they very properly exposed and condemned by striking out of the calculation all deaths of persons of 'those ages which are chiefly affected by migration, and to compare only the deaths under 15 years of age.'[1] But although this limitation might suit Manchester, it would not apply to Brighton, Cheltenham, and other places of resort for health and *education*, for in these towns the immigrants under 15 are probably more numerous than at any other period of life, owing to the existence therein of very large educational establishments.

In short, the particular method of correcting a death-rate, suggested by the Manchester statisticians, is not generally applicable. Records of population movements must be kept, and the population, as well as the births and deaths of each place, must be subjected to analysis, before any just comparisons can be instituted.

Again, Dr. Whitehead[2] has shown how exceedingly objectionable the usual mode of calculating the ratio of mortality becomes when applied to a manufacturing centre *maintained*

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[1] Report of Manchester Sanitary Association, 1864, p. 7.

[2] 'The Rate of Mortality in Manchester,' 1864.

by immigrants of rural extraction, and deprived annually of a large proportion of the children and old people of its wealthy classes, by the superior attractions of fashionable watering-places.

It is indeed a melancholy fact, which cannot be too frequently impressed on the public, that 'without a continual inpouring of population at the healthiest ages from the country, the great town communities would waste away by a natural, or rather unnatural, decrease.'[1] Besides, in determining the death-rate of a district, inhabited in great measure by nomads, by comparing the average number of residents with the annual number of deaths, we do but repeat an exploded error analagous to that of some hospital statisticians, who estimated the mortality and even the sanitary conditions of hospitals and infirmaries by their respective *bed* death-rates. In the one case the same house may have been occupied by 4, 8, or 12 successive families; in the other case, the same bed may have been occupied by many persons in succession, and the chances of death may thus have been proportionately multiplied.[2]

So sad, indeed, is the neglect of all the decencies of life

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[1] 'The bulk of the immigrants are probably in good health, but a certain number of the sick resort to the town hospitals; on the other hand, of the emigrants some are consumptive, seeking health in the country or abroad, or returning home to die; but the emigrants are less numerous in the aggregate than immigrants, and so far have less effect on the mortality.'—*Supplement to 25th Annual Report of the Registrar-General*, p. xxv.

[2] 'Death-rates of places inhabited by labourers and artizans are always, compared with more opulent neighbourhoods, increased by the circumstance that an extraneous population are ever pressing in to fill the vacuum occasioned by removal or death, so that the same domicile may, within the twelve months, contain a succession of four families, and really represent the accidents, diseases, and deaths of twenty-four persons, instead of the six which the Census gives as the population of each house.'—Dr. Trench—*Report* 1865 *on Health of Liverpool*, p. 56, note.

in some newly-peopled mining districts, that the beds are never empty—one relay of men from the pits 'turning into' the unaired and even uncleansed beds just vacated by the preceding gang.[1]

III. Lastly, I have to notice the effect of Public Institutions upon local death-rates.

1. Dr. Farr has virtually admitted the error of including the vital statistics of hospitals, asylums, and workhouses in the totals from which his death-rates are to be calculated. Those famous tables,[2] in which were displayed, for the two decenniads 1841–50, 1851–60, the density of population compared with the average annual mortality of each district, record the number of the larger ('the small institutions are not noticed,' p. xxxvii.) public institutions in each district, while they leave inquirers to imagine what may be the precise effect on the death-rate of the 'excessive mortality' said to exist within their walls.

We are, however, informed that in calculating the mortality of the London districts, an approximate correction has been made for deaths in the principal hospitals, 'and in workhouses situated out of the district to which they belong.' The latter are carried to the account of their proper districts in the metropolitan division. But the correction is based on the unwarrantable assumption that the inmates on the day, and the deaths in the year, represent the average number of each throughout the *decennium*. The facts, if ascertained, might materially alter the calculated results.

A similar source of fallacy distinguishes Dr. Farr's celebrated Table of Hospital Mortality,[3] on which insecure

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[1] Dr. Hunter's Report on New Townships in South Wales (8th Ann. Rep. M.O.P.C.).

[2] See Supplement to the 25th Annual Report.

[3] 24th Annual Report, p. 205.

foundation Miss Nightingale built such plausible conclusions in 1863; but to this question I shall revert.

The method adopted in the former tables was doubtless the best at the command of the calculator; but the assumption, however reasonable, does not, to the lover of truth, compensate for the utter absence of authentic information. The *facts* of hospital and workhouse population and sickness are not to be found. Moreover, the benefit (if any) of these 'approximate corrections' was confined to the London districts, for we learn that—

'No correction has been made for county and other general hospitals out of the metropolitan districts. A correction has been made in calculating the mortality of districts in which large naval or military hospitals are situated, and also of those districts which contain the various county lunatic asylums.'

The memoranda contained in the notes to the population-density tables would doubtless be of use in the compilation of a statistical record of the principal establishments for the relief of destitution, infirmity, and sickness throughout England, and vast would be the advantage of such a record. But, until a proper machinery shall have been constituted for the purpose—all medical charities being brought under medical inspection—those who desire exact and reliable information must obtain it, if they can, from the few provincial statisticians who may be permitted to visit and report on those institutions.

2. It would be a profitless task to expose, on a large scale, the errors of those published returns which attribute to the districts wherein public establishments exist all the sickness and mortality occurring within their walls.[1]

[1] The case of Clifton was so ably illustrated by my lamented friend Dr. Symonds, that I cannot forbear calling attention to it.

Important errors had been circulated by the Registrar-General in the tables of the 16th Annual Report and in Quarterly Returns. These errors, however, were officially acknowledged in the Supplement to the

But I may mention that so long ago as 1848, when I investigated the mortality of Gloucester for the Registrar-General, I resolved to eliminate from the city death-rate the error caused by the inclusion of public institutions; and I succeeded in tracing almost all the fatal cases of the previous year, in the workhouse, county asylum, infirmary, and county prison, to the towns or parishes from which the diseased patients, paupers, or prisoners came. I separated the deaths due to the city and suburbs from those belonging to rural parishes, and those beyond the registration district. It is obvious that, before this analysis, the city and suburban death-rates were most unfairly exaggerated.

Dr. Buchanan Washbourne, who carried on these inquiries for a series of years, with far greater completeness and success than I was able to do, has shown that the differences in the general death-rate caused by the fatal cases in public institutions varied from 1 to 1·6 per thousand of population.

If a similar process of separation—not a difficult one—were carried out systematically and by authority in every county or group of registration districts, and in every large

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25th Report, and certain corrections made for inmates of public institutions. In the case of Clifton, these corrections reduced the former (reported) high death-rate to one of 20 per 1,000. But the original misrepresentation was shown by Dr. Symonds to be of greater magnitude, by an analysis of the deaths according to sub-districts. To notice that of Stapleton, consisting of a group of charming healthy villages. Here, the gross death-rate for the ten years, 1851–60, was said to be nearly 33, the annual deaths averaging 290. For the next three years the deaths rose to an average of 330; and official people shook their heads. But when Dr. Symonds deducted the deaths occurring in the great workhouses of Clifton and Bristol, and in the public lunatic asylum, all three wisely built in this salubrious sub-district, the really local mortality sank to an average of 134, or a death-rate varying from 13 to 15, to which a slight addition would have to be made, if certain deaths due to the sub-district had been withdrawn from the death-rolls of those establishments. *These facts, be it observed, are nowhere to be found in the Registrar-General's reports.* Dr. Symonds's eloquent description of this case is to be found in his 'Miscellanies,' p. 365. London, Macmillan, 1871.

borough or sanitary jurisdiction throughout the kingdom, the necessary subtractions and additions being officially exchanged between the several districts, the influence of locality and other previous conditions of life upon pauperism, crime, want of education, disease, infirmity, and mortality might be correctly ascertained, and the information circulated with great public advantage.

3. It is dangerous to apply to questions of local insalubrity and disease-causation the doctrine that errors compensate themselves in large averages. Were comparisons of rates of sickness and mortality confined to the same district at different periods, or to similarly inhabited parts of distant districts; or were there no sources of disease—constitutional or zymotic—strictly attributable to locality; or were there no particular neglects or abuses in local administration to expose, we might be reconciled, on the theory of compensation, to the inclusion of hospital and workhouse statistics in the published district returns.

Yet, simply because some apparent diminution of death-rate in low neighbourhoods, caused by removals to hospitals, may not be greater on the whole than that in more respectable places, caused by removals to the country or the sea-side,[1] we ought not, in the interests of the public, to rest satisfied with a general misrepresentation, that is, with returns which never accurately represent the relations of disease to death, or of either to population.

4. All attempts made hitherto to report the statistics of Medical Charities, whether by central departments, or by statistical societies, or by zealous volunteers, or by the

[1] See Dr. Trench's Report on Liverpool, 1865, p. 54.

In Dr. Richardson's able paper on Birmingham (*Med. Times*, Oct. 15, 1864, p. 419), Mr. Sargant is quoted to show that the hospitals and public establishments of that town receive a number of fatal cases from the surrounding *rural* districts, which more than balance the deaths of townspeople in those districts.

governors of single institutions, have been characterized by this glaring defect—that their published returns supply no materials or facts whereby the antecedent life, the place of previous abode, and the occupation and class of each inmate may be connected with the result of the injury or disease or operation, from which he either recovers, or remains uncured, or dies. There is but one certain means of supplying this defect of information, and thus of preventing all the romantic estimates, fanciful assumptions, and groundless conclusions which follow upon ignorance of facts.

In order that the sickness and mortality of the inmates of public or charitable institutions may be traced to their real sources, some competent authority, personally acquainted with the district or county, and habituated to scientific and statistical research, must be empowered to obtain the required particulars from the register of every hospital or asylum, every almshouse or workhouse, every industrial school, penitentiary, or prison within his jurisdiction.

In one memorable year, indeed, there was an almost universal inspection of hospitals in the kingdom. The Privy Council, acting on Mr. Simon's advice in 1863, appointed Dr. Bristowe and Mr. Holmes to make a thorough inquiry into the sanitary circumstances and results of British hospital practice.[1] Those gentlemen reported fully on eighteen metropolitan hospitals, of which twelve were general and six special, also on fifty-eight provincial hospitals, of which five were special and the rest general,[2] besides twenty-four hospitals in Scotland and Ireland. This valuable record, though deficient unavoidably in the information to which I have referred, might serve in many particulars as a basis for

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[1] Sixth Report of Medical Officer of Privy Council, pp. 38, *et seq.*, and Appendix.

[2] Ibid., pp. 569, 570.

those more precise and detailed returns which ought to be made periodically, on an uniform plan, in every county, by officers thoroughly qualified for the duty and exercising general sanitary functions.

5. My principal object in this section has been to show that the total sickness and general death-rate of a district are much aggravated by collecting a number of sick, hurt, infirm, ill-conditioned, or otherwise miserable persons in any great building erected within its boundaries.

'To test the healthiness of a site,' says Captain Douglas Galton, C.B., F.R.S., ('Construction of Hospitals,' 1869, p. 3), 'an inquiry into the rate of sickness and mortality in the district will afford valuable information as to its suitableness for sick. But care should be taken not to be guided by the mortality alone, for it by no means follows that a district with a low rate of mortality is suitable for the sick. The nature of the diseases, and the facility or otherwise with which convalescences and recoveries take place, must also be taken into account.'

But I can hardly leave the subject without a few words on the vexed question of 'hospital mortality.' For besides the obvious relations of the locality to the previous residence, conditions, and habits of the inmates, it would be rash to deny that the very aggregation of human beings increases the sickness and mortality, directly of the institution itself, and indirectly of the immediate neighbourhood. A few years ago Mr. Simon, Dr. Bristowe, and Mr. Holmes, to whose report I have already referred, succeeded in damaging some and demolishing other statistical conclusions of certain estimable hospital reformers. They showed that a *bed death-rate*, *i.e.*, the number of deaths in an institution divided by the number of occupied beds [in that particular calculation, by the 'accidental inmatage of a single day'] is 'for any hygienic argument of all general death-rates the most fallacious.'

They also showed that the deaths occurring in one hospital cannot be fairly compared with those in another, unless the number of cases treated are also compared, unless those cases —whether medical or surgical, or both—are of equal 'mean gravity,' and admitted under the same conditions and regulations, unless, moreover, the ages, constitutions, and physical vigour of the patients are on the whole equal in the hospitals compared. They nevertheless failed to prove that aggregation *per se* had nothing to do with the causation of certain hospital diseases and the consequent increase of mortality. They also failed to establish a point which they seemed anxious to prove, viz., that hospital construction and ventilation on the best plans, 'fastidious cleanliness,' sedulous attention, scientific care, and treatment of the best quality, might possibly supply to the patients of a vast hospital, in the midst of a great town, advantages equivalent to those natural aids and restoratives, that profusion of pure ozonic air, which the indigent occupants of many a wretched cottage enjoy in a sparse population, and which enable them to recover in greater proportion and more rapidly than the inmates of a metropolitan institution, attended by some of the ablest physicians and surgeons of the day.

I will not trouble you with an array of figures. They are mere *Will-o'-the-Wisps* in this foggy region. The numerical scale of hospital mortality, which led to the controversy of 1863–4, first formed the groundwork of Miss Nightingale's celebrated attack on our old hospitals. The figures were, however, shown, by the official investigators before named, to be worthless, except for the purpose of concealing or confusing the real points at issue.[1]

6. A later and more interesting stage of the discussion is that which was interrupted more than a year ago by the

[1] See an interesting passage-at-arms between Dr. Farr and his reviewer, in the 'Med. Times and Gazette,' Vol. I., 1864.

death of the great man who has left on it for ever the mark of his brilliant genius and untiring energy.

I am not about to defend Sir James Simpson's statistics; for, like all other privately-made collections of facts, they are open to question on public grounds. Nor do I admit as indisputable all his inferences. But I am not aware that any one has brought so large a number of facts to bear upon a single class of cases as he did with regard to *limb amputations*. He collected reports of no fewer than 7,000 amputations,[1] from which he tabulated above 2,000 in large metropolitan hospitals and above 2,000 in country practice, leaving nearly 3,000 in provincial hospitals less rigorously classified than the others, yet available for the following comparison—the only table I shall quote from him.

There is such a wonderful coincidence between theory and reported fact in this calculation as almost to startle one; but a reference to the original tables and to his defence of them would satisfy many a sceptic.

DEATHS AFTER LIMB AMPUTATIONS.

Place of Operation.	Deaths per cent. of cases.
Large Parisian hospitals (from M. Husson) . . .	62
British hospitals—	
Beds, 300 to 600	41·1
201 to 300	29·6
101 to 200	22·6
26 to 100	17·7
Under 25	13·8
Isolated rooms in country practice, including mines, collieries, and factories	10·8

The striking contrast between the results of operations in the greater hospitals and those performed by country surgeons excited much hostile criticism. Some of our leading hospital surgeons vehemently denied the accuracy of the returns,

[1] See Tables in 'Edin. Med. Journal,' 1869.

which on the other hand were as warmly defended by some of the country operators.[1]

It is not improbable that a complete national registration of cases—operations being specially reported—might somewhat alter the numerical ratio of success claimed by Sir James Simpson for provincial practitioners; but I think that few, if any, unprejudiced persons could examine his singularly powerful defence of twenty-one 'propositions'—published in the 'Lancet' of 1869[2]—without acknowledging that he had substantially proved his many points, even though his returns might not be perfect.

7. The general results of the discussions to which I have referred appear to be:—

(1.) That the deaths in hospitals and other large institutions, especially the mortality following operations, (and universally that after childbirth), are vastly increased by the mere aggregation of patients, and *cæteris paribus*, in proportion to the density of that aggregation, apart from all

[1] In this, as in some other matters of social and intellectual inquiry, metropolitans are too apt to ignore or under-estimate provincial efforts and results, and to consider them of importance only so far as they may contribute to central supremacy. This sublime self-complacency—this indifference of the 'happy gods' to the struggles of mortals—is not a little amusing to provincial Titans. The serenity of Olympus may, however, be disturbed, as when some rural Promotheus is said to have stolen the fire of Jove.

The mere report that country surgeons are more successful in the capital operations (as regards the life of the patient) than those at the seat of government, amounts to a *crimen læsæ majestatis*. In the judgment of an orthodox hospital clique, it is a heresy undeserving toleration. Yet, are we to believe that there is something in the atmosphere of London (*query*, of its hospitals) which exalts the medical judgment and perfects the surgical skill?

[2] The last of that series ended with the words 'To be continued.' Alas! he was not permitted to fulfil his laudable design, and to treat of hospital construction and alteration. He soon afterwards broke down, and within a few months was taken from us. Mr. Lawson Tait has done good service by a recent defence of his great master's works on hospitalism in the 'Lancet.'

other circumstances which might affect success or endanger life; (2.) that the death-rate, calculated as it should be, on the number of patients, and not on the number of beds, increases with the size of the establishment and the number of its inmates; and, (3.) that wherever this assemblage of the sick and hurt occurs in the centre of a crowded population, the ratio of mortality attains its maximum.

It would be out of place in this paper to review at length the ætiological and pathological controversies which this question of 'hospitalism' has evoked. I may, however, be excused for saying that the best authorities and most scientific observers confirm the doctrine that organic particles emanating from the bodies of the sick and wounded, especially in certain kinds of fever, inflammation, eruption, or discharge, may directly by contact, or indirectly through air, water, food, clothing, and even the walls and furniture of the building, &c., infect the previously healthy, and create in them diseases the same as or analogous to those of the persons from whom they proceed.

It is, I believe, yet undetermined whether certain of these organic particles are zymotic in their nature, whether they are living germs or spores, conveying specific morbid poisons, or whether matter simply in a state of decomposition or catalysis, communicating specific molecular action or motion. It does not practically concern us whether they be specific entities or specific conditions of matter. They are certainly 'more subtle, inscrutable, and deadly' than any which we can subject to chemical analysis or microscopical examination.

Because no one has yet detected or produced the essential *materies morbi* of typhus, of intestinal fever, of cholera, of influenza, of erysipelas, of scarlatina, or of diphtheria, it is neither safe nor philosophical to deny their existence.

It is notorious that the liability to the communication of these poisons increases with the number of persons, diseased

or healthy, who are brought within reach of the special morbific influence, and generally in proportion to the *degree of their proximity*. Beyond all other media, the air avails to suspend and circulate these infections, itself becoming impure, or at least losing its natural power of purification, by reason of the multitude of persons who inhale it and mutually deteriorate it; and this disease-carrying condition of air is of course greater in proportion to the density of the surrounding population.

8. The inquiries and reports of the last half century leave no doubt that in proportion to the condensation of human and animal life, so does the liability to disease and death augment; and there is no reason whatever why a natural law, which regulates the average sickness and mortality of our districts, should be inoperative in hospitals and public establishments. As before said, no amount of cleanliness can wholly prevent the real danger of aggregation. Sanitary regulations may diminish and control the evil; but the special atmospheric deterioration which attends on density of population is too irremediable a condition to be cured by mere ventilation; for this, whether natural or artificial, is unavoidably subject to casualties and incurable interruptions, and in crowded localities may only more rapidly circulate *impure* air.

[1875.—The effect of old structures, especially those occupied by surgical (or obstetrical) cases has had lately a striking illustration in the disclosure of lamentable facts relating to the Norwich Hospital, once reckoned among the most successful of provincial institutions.

Dr. Beverley's courageous and faithful report on hospital pyæmia, read at the Medical Congress in 1874, and the soundness of his conclusions, leave little room for doubt on the subject, though the precise extent of the necessary reforms may still be open to discussion. He says (*British Medical Journal*, p. 314):—

'Are the surgeons of the Norfolk and Norwich Hospital to remain content to lose 66 per cent. of their amputations for injury, and 10 per cent. of their amputations for disease, from causes which are said to be preventible? Is pyæmia to be allowed still to reduce their lithotomy average to the present rate of one in 6·58? Are there to be no means taken to prevent a recurrence during the next ten years of twenty-four deaths in ninety from pyæmia in the major operations, two in nine in the minor, and sixteen from accidental wounds? Is an annual death-rate of four from pyæmia (liable to be increased in any year to seven or even twelve) not to be counteracted?

'The *status quo* cannot, must not, be allowed to continue. It would be better far to do away with the hospital entirely, and let those who now unconsciously run the gauntlet of its hidden dangers submit to surgical treatment in their own cottage homes, where they would have an undoubted better chance of recovery, even from the greatest accidents and operations, than in the wards of our hospital as it now exists, even with the aid of efficient nursing, good food, and the care and skill of its surgical staff.

'Mr. Cadge said:—"I have unwillingly and almost tremblingly proceeded to operate in the hospital; but I have had a happy confidence and a perfect assurance that in all private cases I should avoid any of these disastrous consequences; and I come to the conclusion in my own mind that pyæmia, if it do not find its birth-place, does find its natural home and resting place in hospitals, and, although a hospital may not be the mother of pyæmia, it is its nurse."

'Here then are the facts:—A pyæmia-stricken hospital, centenarian in age, original form and sanitary arrangements good, but spoiled by subsequent additions, its requirements for the reception of surgical patients and serious accidents of all kinds still greatly increasing. Such is the problem I ask you to help us to solve. Whatever is done there should be *no additions to the present building*. Mr. Erichsen states: "There is one remarkable circumstance connected with the age of hospitals: that new buildings added on to old hospitals become more unhealthy than the original building." I do not think it will be necessary to pull the hospital down and build an entirely new one, although, if we had the funds, such would probably be the wisest course. This had been done at Lincoln, where it was found (after years

of attempts to root out pyæmia by renewing the interior of the hospital, improving ventilation, &c.; in short, taking the same steps as we are now taking at Norwich,) that nothing but demolition would remove it. . . . . My proposition is to have a series of one-storied and separate buildings, dotted over the ground which has been bought for the extension of the hospital; that these buildings should be in sufficient numbers to admit of one for each sex being kept always empty, so that, after the plan recommended by Billroth, no ward should be used for more than a month or six weeks in succession.'

Captain Galton says, in his excellent work (p. 22):—

'A simple inexpensive hut for a few beds, capable of perfect ventilation, and admitting of being occasionally pulled down and rebuilt with fresh materials at no great expense, would in all probability afford more recoveries from fever and wounds than the most costly special hospital wards.'

Many old hospital walls and fittings have been as it were saturated with morbific emanations. The demolition of the structure remains then the only cure for the evil. It will soon become a question for how long a time a hospital ought to be allowed to stand. Hence, the WARD rather than the great hospital must be the future unit of construction and management. The slighter building with fewer inmates must be taken to supersede the populous hospital, even if of grander proportions and more distinguished by medical celebrities.]

The conclusions which I venture to draw from the published records on the hospital question are as follows:—

First, that far less as may be the risk to the patient of treating his fever or amputating his limb in a separate well-aired cottage—a hospital, like a workhouse, is a necessity of our present stage of civilization—and, if well constructed and regulated, confers many and great benefits on the community, supplying also an indispensable means of advancing and imparting medical knowledge.

Secondly, that—while temporary depôts or ambulances for the sick and hurt ought to be employed in populous centres—hospitals and infirmaries, like slaughter-houses and graveyards, should, as a rule, be located *extra urbem*, and that many of our old collections of the sick should be swept away.

Thirdly, that the rapid progress of mechanical and civil engineering, and the triumph of locomotive art over distance and time and natural obstacles, are removing all apparent difficulties in the transit of patients, doctors, and pupils. Thus, it may become comparatively easy to banish from towns many institutions, the inmates of which either are injured themselves or injure other persons by their number or the closeness of their aggregation.

APPENDIX A.

REGISTRATION OF DISEASE.

[*From the 'British Medical Journal,' March 2nd, 16th, and 23rd,* 1872.]

I.—*Its Principles and Methods.*

THE question of sickness returns, as contributions towards a national registration of disease, is now generally acknowledged to be intimately connected with that of improved sanitary administration, and not less so with that of an amended system of medical poor relief. All this was foreseen and urged by those who for many years have been engaged in promoting the establishment of a scientific and practically useful registration of sickness. But from time to time, in the progress of the question, some one or other energetic reformer has come forward to press the immediate, though partial and fragmentary, attainment of this object, without sufficient regard to its necessary connection with a normal medico-sanitary organization; and of late a party has arisen which desires to centralize this measure, and to make it a mere affair of Poor Law medical officers and a Government board in the metropolis.

It will be easy to show how utterly opposed this centralizing plan is to the principles on which the leaders of this movement started fifteen years ago, and have steadily proceeded until the present time. Those principles were enunciated, though not for the first time, in 1860, by a special committee, 'On Registration and Sanitary Police,' of the Social Science Association. The object of our veterans was to combine with a scientific superintendence of the registration of births and deaths, in each district or group of districts, a record of all sickness attended at the public expense. The method proposed in 1860 to effect this object, in the absence of a corps of superior health officers, was to substitute, as vacancies occurred in the body of superintendent registrars, 'an order of highly-qualified *medical* superintendents,

whose scientific attainments and practical efficiency should be duly tested by examination or otherwise before their appointment.' (*Trans. Soc. Science Association*, 1860; *Introd.*, p. 28.) It was also proposed to separate the duties relating to marriages, leaving them in the hands of the clerks to the boards of guardians. The proposed scientific superintendents of registration were also to be employed as officers of health in their respective districts. The defects of this project were obvious. It could only have been realized by slow degrees; and for years there would be no general compilation of results worth publication.

Nevertheless, the plan embodied this important principle: that the chief sanitary officer of every group of unions and of every first-class town was to be the compiler and reviser of the mortuary and sickness returns of his district, in order mainly that, after due correction, the facts should be promptly and vigorously utilized in the health-protection of the locality, and be afterwards condensed in national records to be published by the General Register Office. A leading feature of this plan in a few years afterwards was sanctioned by Dr. Farr, in his masterly Letter to the Registrar-General (1866), wherein he suggested important improvements in the machinery of mortuary registration, to be carried into effect chiefly by a 'registration medical officer' in each of the registration districts.

This valuable suggestion was promptly seized by the Committee of the British Medical Association, 'On the Observation and Registration of Disease;' and at a meeting of that Committee, held at Manchester in October 1866, it was earnestly supported in a series of resolutions, which were communicated, with an abstract of Dr. Farr's project, to this Journal by Dr. Ransome (*British Medical Journal*, Nov. 3rd, 1866,) and on which we commented in a comparatively recent article. (*Ibid.*, Sept. 3rd, 1870.) The second resolution was thus embodied by the same Committee in their Annual Report of 1867:—

'The Committee consider that such an officer (Dr. Farr's registration medical officer) would not only greatly promote the correct registration of deaths, and improve other public medical services, but that *he would also be the suitable authority for collecting and publishing the returns of disease* obtained by local associations.' (*Ibid.*, August 24th, 1867, p. 159.)

This well-considered proposal to combine a local machinery for improving the record of causes of mortality with one for the registration of disease, has thus obtained a *prestige* to which no

other scheme can pretend. It has been supported by successive committees of different associations, as well as practically illustrated by those successful labourers in the cause, Dr. Ransome, of Manchester, and Dr. Philipson, of Newcastle. It is virtually adopted by Dr. Trench, of Liverpool; in fact, it represents the sum of experience and enlightened opinion on the subject.

The principle was confirmed by resolutions proposed by Dr. Farr, and passed in the Health Department of the Social Science Association at Birmingham in 1868, resolutions which implied the connection of an improved local registration agency with the duties of medical officers of health.[1] Finally, the very method has been recommended in the last resolutions of the Joint Committee recently presented to Mr. Stansfeld. The seventh runs thus:—

'That, with regard to the registration of sickness, the compilation of reports of sickness and its causes, from the returns of medical officers and medical relief institutions, and the revision of the returns of deaths and causes of deaths, be committed to the chief officers of health within their respective districts, and that revised summaries be by them forthwith transmitted to the central authority.'

Administratively, the project is based on the establishment of Local Centres of information and advice, the skilled officers of which would be the primary recipients of the reported facts of mortality and sickness, would revise and correct them, apply them promptly to local exigencies, and transmit summaries without delay to the central department for national instruction.

Official critics of this complete and consistent project have objected to 'the intervention of a third party,' that is, a local reviser, on grounds which will not bear examination. For instance, it has been assumed that, the recorders of the facts of pauper-sickness being generally medical practitioners or dispensary officers, any local machinery for collection and revision would be unnecessary. We are unable to admit this assumption. Independent and skilled supervision would be essential. Although a large proportion of the returns might be complete and correct, yet, coming from so many contributors, some might be quite the contrary, especially those from medical charities and provident institutions. In the words of an able reviewer:—

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[1] See *Transactions of the Social Science Association* (Birmingham Meeting, 1868); Introduction, p. xxxiii.

'The local machinery employed for the compilation of sickness returns should be of so skilled a nature as to insure their accuracy and validity, and to apply them promptly and authoritatively to local requirements. . . . Much more would such local knowledge be required in preparing information for the central department. . . . If we consider the variety of sources and the large body of observers from which the returns are to be obtained, uniformity and strict accuracy cannot be looked for. Provincialisms, introduced in carelessness, or wilfully in deference to ignorance at the board of guardians, will have to be reduced to the common terms of a reformed nomenclature; contradictory assertions, such as are common in death certificates, and now pass unchallenged, must be inquired into and corrected; careless and imperfect entries must be filled in and amplified, before the true meaning and weight of the collective mass can be rendered intelligible to the central authority.'[1]

It involves no slight or discourtesy to the district or dispensary medical officers to relieve them of the proposed task of analyzing or abstracting their own weekly lists. It would save enormous labour and expense at the central office to be furnished with only about a hundred summaries from local centres, instead of several thousand raw returns from all the medical officers and charities.[2]

II.—*Its Connexion with Sanitary Organization and Administration.*

Having explained the principles of the project supported by the Joint Committee, we now proceed to show the defective nature of the rival scheme, which appears to be advocated by the Royal Sanitary Commission. Sir Chas. Adderley may be fairly supposed to express the intentions of that commission in clauses 72, 73, 74, and 75 of his enormous Bill. According to these clauses, such 'reports of particulars respecting sickness' as may be required by the Local Government Board are to be made by all the Poor Law medical officers, and by the managers of all medical charities and public institutions, to *such persons* and at *such times* as may be required by the same authority; and these

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[1] 'A National Registration of Sickness' (*Brit. and For. Med.-Chir. Review*, April 1871, p. 407). We commend the whole of this article to the careful consideration of our readers.

[2] See Mr. Lewis's excellent paper on 'National Returns of Sickness' (*Sessional Proceedings, Social Science Association*,' 1869-70, pp. 314, 315.)

returns are to be paid for by that Board, at a rate approved by the Treasury. Mr. Stansfeld practically adopts the same course, without making any provision for paying the reporters. If Parliament should assent to this proposal, it will become simply a matter of communication between the local recorders and the Central Board; and the nature and frequency of that communication will be decided by the latter. Local Centres for collection, revision, and compilation are to be dispensed with. The accuracy and regularity of the mortuary and sickness returns, the truthfulness and completeness of the certified causes of death, the correctness of the nomenclature of disease, are all to be left, on this plan, virtually without any reliable means of verification or amendment.

None but inveterate centralizers would doubt that scientific officers, having the requisite knowledge of local circumstances, and superintending districts of an extent not too wide to admit of inquiry (by themselves or their deputies) into facts which may not be returned at all, or which may be only partially or incorrectly reported, would confer upon the registration of mortality and sickness a validity and worth which must be wholly unattainable under a system depending solely on the direct transmission of returns from some five or six thousand original sources of record, and their manipulation by the clerks of a Government office in the metropolis, without the means of local observation and correction.

Rapidity of central publication seems to be the paramount object of this party. Bundles of crude or hastily abstracted returns, shovelled off by mail, are to be submitted to some unknown and mysterious process, in Somerset House or Whitehall, in order that a striking picture of what, by a sort of euphemism, is called 'the state of the public health,' may be presented weekly by the central authority to a sleepy public. There is something quite sensational and American in such a stroke of business; but the results might prove hollow and untrustworthy. All the solid advantages of a good registration system might be sacrificed to the brilliancy of a weekly *tableau*, and, worse still, to the claims of a central power which appears desirous of initiating, as well as guiding, all the sanitary work of the country.

Instead of the speedy employment of corrected returns by a select and not too numerous body of medical superintendents, who would authoritatively impress the facts at their command upon the various local bodies within their cognizance, for the immediate arrest of preventible diseases and removal of causes of

mortality and degeneracy,—a very numerous and undisciplined army of practitioners, acting also as medical officers of health, must wait until the central authority should be pleased to inform them officially of the facts which occur in their own districts, and to direct them to adopt measures wanting, perhaps, that special adaptation to the locality of which a superior resident officer would be the most competent judge. We repeat that the central publication of abstracts, however gratifying to the central staff, is of infinitely less importance to the public than the prompt utilization of corrected returns in local administration.

It has been objected to the Joint Committee's scheme, that injurious delay would be caused by local revision. Delay of what? Not delay of local action, for that, as we have shown, would be facilitated by the local process; but, we suppose, a possible delay of the central analysis. Yet, if the main object of central publication be not the instruction of the public and of local authorities, what is it? Does the central authority desire to be enabled to originate all preventive measures in all places? We need not say that such a principle of action must tend to stifle independent efforts in districts, to sap provincial energy, and to reduce sanitary administration to a mere machine, wire-pulled by a central automaton.

On the plan of the Joint Committee, every chief officer of health would be enabled and required to announce the outbreaks of epidemic sickness or the prevalence of particular diseases to all the local authorities within his purview, as well as to the chief officers of adjacent districts, and, of course, promptly to the Central Board. The invasion of a pestilence like cholera would be at once communicated to that Board, and by it to all officers of health in the districts endangered. But it could be of no real advantage to the local authority (say) of Leeds to be immediately informed by Government of the prevalence of scarlatina at Plymouth; or to that of Bangor to know that measles or influenza had broken out at Dover, or that there was an excess of bronchitis at Hull.

With the design of promoting this vaunted celerity of universal publication, it has been suggested that 'the sickness returns should be confined to a limited number of tolerably well-defined diseases.' This startling proposition opens new questions for discussion. Who are to be the judges of what is to be reported and what is to remain in the dark? Are the records of cases, returned periodically by the local medical officers and from

medical charities, to be first analyzed, so that certain kinds of disease may be selected from the mass for public enumeration? And is this labour to be imposed on the local contributors? If so, even were a list of the required diseases furnished to them by the Government, the proportion of cases returned to the central office would vary according to the widely different notions of nosology and ability of diagnosis among five thousand or more contributors. So obviously defective an arrangement cannot be seriously advocated; and as, according to the centralizers, there are to be no Local Centres for such analysis, the only alternative would be to send off the gross returns to the metropolis, in order that the chief of the Statistical Department might apply his own principles of selection, and inform the public only to that extent which in his judgment might be advisable. Successive chiefs might entertain opposite views on this point, and, as in the matter of classification of disease, might present different aspects of the same condition of public health. Moreover, the cost of the central department would be largely increased by such an extension of its work. Surely these are not the results for which the promoters of a national registration of disease have so long and so earnestly struggled.

Again, the position of the medical officer of health would be entirely different on the two systems. On that advocated by the Joint Committee, he would be, as he ought, a primary and essential element in the sanitary organization. He would act as inspector, with an office and clerk, at each Local Centre, of which there need not be more than a hundred in England and Wales, exclusive of the metropolis, to which the central department itself might reasonably supply the required inspection. To the chief officer at each Local Centre would be entrusted much discretionary power, and the inauguration of many preventive or otherwise beneficial measures within his area of observation. Moreover, he would be effectively aided by the Poor Law medical officers or by the medical officers of the smaller local boards, who would act as his deputies, and from whom would be selected his successor. On the centralizing plan, the health officer would be simply the informant and agent of the central authority. He would be one of a numerous body competing with other practitioners, and regarded with no little jealousy by the still larger number who fail in obtaining sanitary appointments.

With regard to the weekly returns, we cannot do better than quote a former leading article:—

'If (Mr. Lewis's) suggestion about the transfer paper were adopted, the Poor Law medical officers could supply the health-officer every week with an exact copy of their relief-entries; and it would be his business, when he had got all the returns for his district complete, to send a summary of their facts to the central office straightway.' Or, in Mr. Lewis's own words, 'I have already twice recorded my conviction that it is impracticable as well as unnecessary to think of sending to a central office for frequent publication anything beyond mere summaries of local details.'—*British Medical Journal*, December 3rd, 1870, p. 605.

Now, were these summaries to be made by all the Poor Law medical officers and all the medical charities, not only would they lack uniformity and betray the want of supervision, but, as we have already shown, the proper and rational order of proceeding would be reversed; and the medical officer of health, instead of coming between the recorders of primary facts and the central department, would be made the last of the series, and would probably become a mere tool in the hands of the single moving power.

We trust, therefore, that our centralizing friends may curb their æsthetic proclivities, and be content with recommending the quieter but safer course of publishing, as Mr. Simon has proposed, quarterly reports, in abstract, of the sickness of the poorer classes, founded on the summaries furnished to them by a superior order of sanitary experts, acting for counties or divisions of counties, or first-class towns, and to whom the dispensary medical officers would supply the facts from which the summaries would be constructed. The central hobby is in danger of being over-ridden; and his riders, at all events, should be careful how they apply the epithet 'crotchety' to the old workers in the cause, simply because these insist upon a local revision of returns.

III.—*Particulars to be returned.*

The subject of sickness-returns cannot be dismissed without some observations on the particulars to be returned by the original observers, and on those to be transmitted by the local revisers to the central board.

Neither the present form of the weekly return made by the Poor Law medical officers to the guardians, nor the diverse kinds of registers in our hospitals and dispensaries, many of which are but indifferently kept, would serve as models for a national system. The Medical Relief Register of the Irish national dis-

pensaries, and the instructions to the officers concerning it, are much more to the point.

It is admitted by all that the returns should be *weekly* as a rule. They certainly need not contain all the particulars required for a medical relief register. Both the central board and the chief officer of the Local Centre should be empowered to call for exceptionally frequent returns in times of pestilence.

An important question is, whether the weekly return should be confined to *new* cases. The boards of guardians now receive weekly schedules of all cases. Although all the facts reported may be necessary for administrative purposes, the *return* need not contain all the particulars entered in the *register*, which would be always open to a dispensary committee. The weekly return to the guardians, if still required, might be made far less onerous to the district officers than at present. At all events, an abbreviated return of all cases, or a duplicate thereof, should go to the Local Centre; and it would suffice for the central board that the summary, made by the chief health officer, of all the weekly returns from his district, should contain only the *new* cases.

The form of the return, if not of the register, should be, as far as possible, the same for Poor Law surgeons, dispensaries, hospitals, and other sanative institutions.

In addition to the facts ordinarily recorded, namely (1) *number* of case, (2) *date* of application or admission, (3) *name*, (4) *age*, (5) *residence*, there should be columns for (6) *occupation*, (7) date of *commencement of illness*, and (8) *name of disease* or nature of accident. Any secondary disease or complication should be noted in the same column in subsequent weekly returns. There can be no necessity for reporting in the return 'treatment,' a column for which appears in the Medical Relief Register of Ireland, nor yet for 'days when attended or supplied with medicines,' as in that of England; although these facts should be entered in the register to be kept at the dispensary. 'Residence' should be exactly recorded, and should, if possible, include the locality in which the disease originated. 'Occupation' should specify the particular department of the trade or manufacture in which the sick man, woman, or child, is employed. In the column for 'name of disease or nature of case,' ample space should be allowed; or, rather, in order to save the medical officer's time, a number of very narrow sub-columns might be headed with the names of common diseases, epidemics especially according to the list adopted by the Manchester and Newcastle

societies), printed perpendicularly, with one wider column at the end for wounds or injuries, or for diseases not specified in the previous columns.

The 'number' at first given to the patient should be invariably used in all subsequent entries of the same case, until its termination by discharge or death. Initials would suffice for the name; M or F being added in a sub-column for the *sex*.

No entry need be made in columns 2, 3, 4, 5, 6, 7, and 8, for any case after its first return. The number would sufficiently represent it. The 'result' (11), whether dead or discharged, and, if the latter, whether 'cured' or 'relieved,' or 'no further appearance,' with the date, should be entered in the last return of every case. The average duration of cases would by this means be determined. If 'dead,' the cause assigned in the death-certificate should be entered in another column, and if a *post-mortem* examination be made, it should be mentioned in the same column.

The forms of the Weekly Summary, and of the still more important Quarterly Report, to be furnished to the central authority by every chief health officer, would require careful consideration. It is quite possible to express all the leading facts by figures or letters on well-contrived forms. The central department would do wisely to seek for suggestions on this point from men practically acquainted with the working of dispensaries, the diseases prevalent in different localities, and the various kinds of occupation.

APPENDIX B.

[*Copied from First Report of Royal Sanitary Commission, Minutes of Evidence, pp.* 231–243.]

THURSDAY, 24TH JUNE 1869.

Present:

The Right Honourable CHARLES BOWYER ADDERLEY, M.P., in the Chair.

The Earl of Ducie.
The Right Honourable Lord Robert Montagu, M.P.
The Right Honourable Russell Gurney, M.P., Q.C.
Sir Thomas Watson, Bart, M.D., F.R.S.
Lieutenant-Colonel Charles B. Ewart, C.B., R.E.
Samuel Whitbread, Esq., M.P.
John Tomlinson Hibbert, Esq., M.P.
Evan Matthew Richards, Esq., M.P.
Francis Sharp Powell, Esq.
Benjamin Shaw, Esq.
James Paget, Esq., F.R.S.
Henry Wentworth Acland, Esq., M.D., F.R.S.
Francis Thomas Bircham, Esq.

(28.) HENRY WYLDBORE RUMSEY, Esq., M.D., examined.

4269. (*Chairman.*) I believe you are a member of the Medical Council, and also the well-known author of several writings upon State medicine?—I am.

4270. What do you consider to be the main causes of the acknowledged defects in the sanitary management of provincial districts?—I believe they may all be referred to a few primary and fundamental deficiencies in organization. First, the want of systematic inquiry and constant sanitary inspection, aided by complete statistical returns of sickness and mortality and their causes in every district. Secondly, the want of highly qualified resident officers in proper position, by whom sanitary inquiries and inspections should be made and recorded, and statistical returns verified and collected for local use. Thirdly, the want of a single order of competent local authorities fortified by scientific advisers and made responsible for carrying into effect all necessary sanitary measures in districts of sufficient and suitable extent. Fourthly, the want of some clear and adequate definition of the qualifications, duties, powers, and relations of both local authorities and officers. With regard to the first-named deficiency, a national system of sanitary inquiry, inspection, and

record ought, I submit, to be universal as regards localities, continuous and regular as to times, and comprehensive as to subjects. Its results ought also to be readily applicable to sanitary administration. Now there are no arrangements for sanitary inquiry in this country which are at the same time universal and continuous and comprehensive, for certainly no inquiries made by any central authority can be so described. As to local reporters, few and scattered as they are, there is no security for their competency or their due independence; one branch of inquiry and record, namely, that under the General Register Office, is both universal and continuous, but its deficiencies are serious, and its results are not available for prompt local use.

4271. Do you consider that any general system of sanitary inquiry should be based upon local registration?—Yes, certainly. Returns of vital statistics, full and accurate, are indispensable; they are the very foundations of sanitary science and practice.

4272. Such registration being now at work in districts, that is to say, unions, what do you think are the chief defects of that system in a sanitary point of view?—Some of the most important facts recorded on that system are not verified; they are sometimes erroneously reported, and there is no legal security against fraud and concealment of crime, neither are the returns brought home to the authorities and people of each district in a serviceable form. Many other important facts relating to mortality and reproduction and public health are not returned at all; they are not even ascertained. The causes of death are, as I shall explain, very imperfectly returned. Such defects of information render sanitary conclusions unreliable and sometimes fallacious; local sanitary measures based upon them become open to question, if not efficient in operation.

4273. Do you think that the facts recorded by the registrars should be published and utilized in every registration district?—I believe they might be, but they are not; for in all but a very few populous districts, where there happens to be a superior officer of health or some active sanitary volunteer, there are no skilled persons empowered to examine, analyse, explain, and edit the returns, nor are the local authorities able generally to act upon the information if rendered.

4274. In that answer, by 'registration district' do you mean every district of which the board of guardians is the nuisance authority?—I do mean that. I would add that authorized information can be obtained only from the publications of the central

office, that is to say, the General Register Office, and those do not furnish all or nearly all the information that we require. For instance, there are quarterly returns of births and deaths for the 640 registration districts, but those do not and cannot be expected to contain all the particulars of information relating to each place. The ages of males and females who die are published only once a year, and much more than a year after the deaths have occurred. As to sub-districts, the returns of births and deaths are published only in the annual reports and without ages, and without the causes of death. As to other groups of population which may differ widely from the surrounding country and from one another in respect of class, occupation, density of population, and so forth, where such groups or townships do not happen to coincide with the districts or sub-districts, and they are very rarely identical, you can obtain no information from the Registrar-General's published reports; but I must add that for ten of the largest boroughs of England, besides the metropolis, the returns have been published of late, and it is said, for the precise districts under the local boards or town councils, which are the sewer authorities. All other towns I believe are included in registration districts or sub-districts which are not conterminous with the districts under local boards or vestries; there is therefore no general consent between the areas for statistical returns and the areas for sanitary management.

4275. Do you think that the vital statistics of every district under a local board might be collected and returned for the use of that district?—Probably this might be done if there were a local agency for the purpose; at least those particulars which are now entered in the register might be collected and utilized. But this is very rarely done at present, and, after all, those items form only a part of the information which we require. However, the fact is that the registers cannot be analyzed, still less can they be revised and corrected for local use, in the absence of officers qualified and empowered to collect and revise them. The labour of extracting the particulars relating to any group of population, not being a registration district, is immense. No one who has not made the attempt can have any idea of the task. It is no one's duty to make the abstract, and no one can be expected to undertake it as an amateur. A special officer is required therefore to bring this information in a correct form to bear upon local administration.

4276. Supposing that we had such local publication of vital

statistics, what more would you require?—I must trouble the Commission with rather a detailed statement upon this point, but I will make it as brief as I can. As to deaths, we need for sanitary conclusions the following particulars about each deceased person; sex, age, birthplace, parentage, class as well as occupation, civil condition, the exact locality of death, period of abode therein and previous place of abode, besides much more precise and scientific evidence respecting the cause of death. Now, of the above particulars, only sex and age are with tolerable certainty given in the register. Then, although there is a column for the place of death, the fact is often not recorded with sufficient accuracy and minuteness. As to births, there are serious defects in the register. No less than six per cent. of the real number born are admitted by the Registrar-General to be not registered. No provision is made for still-births or for imperfect and immature births. Many alleged to be still-born are brought for burial on the authority of nurses or baby farmers without any guarantee that they were not born alive. The present system affords no check to infanticide. The registration of births ought, I think, to be made compulsory, or virtually so, by attaching more serious disadvantages to its non-performance. It might also be facilitated and improved under a better system of sanitary visitation; still-births ought to be registered separately and not included in either births or deaths. To promote proper returns of those still-births, and of premature or imperfect births, the local supervision of a physiologist or a medical jurist is essential. Again, the age of the mother is not now entered in the birth register, and that is a very important piece of information. The order of birth ought also to be registered; for instance, whether it is a first child, or a second, or a third, or whatever number it may be of the same marriage or mother. This is a point of importance with regard to deaths in childbirth, and deaths from constitutional diseases of childhood. All these desiderata bear generally upon sanitary inferences and sanitary measures.

4277. Do the general death rates of towns or districts afford clear evidence of their sanitary condition?—Certainly not. There is no test of the health and vital force of a town population more fallacious than a general death rate. The death-rate, I need hardly say before this Commission, is calculated from the total number of deaths reported in a given period in a given population, whether enumerated or estimated, and if not for a

year the corresponding annual rate per 1,000 is assumed. But many sources of fallacy are involved in those assumptions and in this calculation. First, it tells nothing of the proportion of persons dying at different ages. The greatest liability to death occurs, as we all know, at the earliest stages of life, and the liability decreases rapidly until the reproductive function is established; then it again slowly increases until the limit of human life. Thus the death-rate differs widely at different periods of life. For instance, the general death-rate of England may be stated at 22 per 1,000 per annum. Of those 22 no fewer than nine die under the age of five years; nine only die during the next 60 years; and four are left to die after 65. But supposing that a town contains double the average [very improbable] number of young children in it, what becomes of the general death-rate for the purposes of comparison? The fact is that the proportions of persons living at different ages, and dying at different ages, vary very greatly in different groups of population. Of course where there is an excess of persons living at ages at which the mortality is high, the general death-rate is proportionately raised, however favourable may be the sanitary condition of that place, and the vigour of its people. If time had permitted, I could have brought forward instances of comparatively high death-rates in healthy, vigorous populations, and the reverse, low death-rates in decrepit and city populations. Even in the same place and people, the death-rate may and does vary greatly from year to year, without a contemporaneous variation in the state of public health. Then I must not omit to call attention to the imperfections of the census, because that is the other element in a death-rate. I would notice particularly its infrequency, the unavoidable inexperience and incompetency of many of the enumerators, and the misrepresentations, wilful or careless or ignorant, of those enumerated. All this has been proved by statisticians of great repute. The ages of infants and women are known to be incorrectly returned on a large scale. Thus, the very elements of a death-rate, namely, the numbers living and the numbers dying at each age of both sexes, are not satisfactorily determined. I might almost say undetermined; certainly not reported; and, therefore, to a great extent conjectural in every district under present arrangements. The fallacy of a death-rate becomes more obvious when we recollect that for nine out of every ten years the population is not enumerated, but

merely estimated.[1] There ought, I think, to be an annual enumeration; not perhaps a complete annual census, but a simple enumeration according to age and sex. Yet sanitary conditions are inferred and sanitary measures are planned, or executed, or neglected, upon the strength of a death-rate calculated on those imperfect data. Extraordinary mistakes have been made in those estimates. Perhaps the famous blunder at Bradford in 1859 may be recollected, which was exposed in 1861, and in which the population was found to be 24,000 less than the estimate of two years previous. A similar blunder was detected in Liverpool where the deficiency was found to be 28,000 less. Although Dr. Duncan was a very able officer of health and a statist, yet his estimate fell short by 28,000. The reckless manner in which those assumed rates of mortality are quoted for or against sanitary reforms is most astounding to anyone who knows what they are worth. In Birmingham last year, in the Health department of the Social Science Association, I heard the supposed low death-rate of that town adduced by the municipal authorities as a reason for not taking any special trouble to remove certain known causes of disease.

4278. I think you were president of that department at that meeting of the association?—I was. Now when that death-rate was analyzed and inquiry made as to the particular places and occupations of those who died, and as to the reported causes of death, it appeared that the mortality had been vastly increased by preventible causes—probably as much increased as in any town in England. Then, I would add that the registers of births and deaths afford us no means of tracing each life from its commencement to its termination, and so connecting the registry of the births with that of the deaths. If only the birthplace were added, the result would show how far higher the mortality of towns really is than it appears to be from the published death-rates. To test what is called the specific

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[1] In a subsequent part of evidence (5092, &c.) it was assumed in both the question and the answer that I here referred to errors in the census, *e.g.* at Bradford and Liverpool. This was an unaccountable mistake, for obviously I referred in these cases only to the estimated, not to the enumerated, census. See the whole question elucidated in my section on 'Population Estimates,' p. 195.

Dr. Farr elsewhere makes the very wise proposal that there should be a Population Register, which would not only record the movements of population but enable individual lives to be followed from birth to death.

mortality of the inhabitants of a place, only those persons ought to be reckoned who were born and who had lived there. In towns the number of the living is constantly recruited from the rural districts, and this alters the ratio of the living to the dying. These errors in the calculations of the death-rates from the register and the census can be corrected only, I believe, by a proper sanitary organization at work throughout the country.

4279. Do you think that the registration of the causes of death is on the whole satisfactory?—I do not. It is true that the proportion of uncertified deaths is diminishing yearly, and a more correct nomenclature of disease may in time aid a better educated body of medical men to return the alleged causes more accurately and scientifically. But our present system of certification depends wholly upon private practitioners, that is to say, upon the medical attendants of the deceased; it must therefore, for obvious reasons, be imperfect.

4280. (*Dr. Acland.*) Are they obliged to sign the certificate?—They are not. Only a part of the truth is revealed or can be revealed under such a system. Of course the evidence of the medical attendant is indispensable, but it should be subject to revision, and any deficiencies should be supplied by an officer of health. The inspection of such an officer, or his deputy, is in my opinion absolutely necessary for those deaths which take place without medical attendance, as great numbers do in the large towns of this country.

4281. (*Chairman.*) What in your opinion are the principal defects in statements respecting the causes of death made to the registrars?—The first is, that many deaths are still uncertified. In 1867 it appears that 4,630 causes were unspecified, and probably many more were uncertified. Secondly, many are certified by medical men who have not seen the deceased either shortly before or after death. Thirdly, many causes are entered by unqualified practitioners acting as assistants to registered practitioners who sign the certificate. I fear that this practice is on the increase. I will give the Commission a single example of it which lately came under my observation, and which, I think, deserves to be recorded. A friend of mine making inquiries of a sanitary kind in a district, on referring to the register as he was permitted to do, discovered that an unusual number of deaths were reported to have occurred from phrenitis or inflammation of the brain; yet the inhabitants of that district were not more mad or excitable than the population at large, and there was

nothing to account for phrenitis as a distinctive disease of that district; and therefore he went into the matter more closely, and he found that the word 'phrenitis' in the certificates was always written in a different handwriting from the signature of the certificate, and it proved on investigation that this was done by an unqualified assistant, his master signing the certificates *en masse* for him and he filling them up at his own discretion. Fourthly, I may mention that great uncertainty attaches to the meaning of the word 'cause.' The Registrar-General proposes that two or more causes should be entered according to the order of morbid phenomena. Now in cases in which more than one cause are entered, I have never been able to find out which of them is or ought to be entered in the statistical record and classified accordingly. There is a great mystery in this classification. Fifthly, some certifiers think it right to state as the cause the earliest link of the chain of causes which end in death. Some select that link in which they have felt the greatest professional interest; and some naturally take the last symptom or phenomenon, because it involves fewer troublesome questions, social or sanitary. Now the most serious statistical errors must result from grouping together those variously certified events, facts of different kinds. Thus a particular death may be entered as caused by apoplexy, or hæmorrhage, or dropsy, and so it might have been immediately, and this is probably the most simple and truthful method. It is the method in use in Germany. The certificate on this plan expresses little more than the manner of death; but the same death under another medical man's care would be traced to some zymotic disease arising from unsanitary conditions, or to some destructive habit of life, or to some constitutional disease which might not be thought creditable to the family or the ancestry. Of course the propriety of stating the real ultimate cause must often be a matter for careful consideration on the part of the medical attendant. With those elements of error and uncertainty, I distrust all calculations of the ratio of death from different diseases, although those ratios have been made use of in what is called industrial pathology, and in many other important branches of scientific inquiry. And here I would mention the advantage which a general provision of mortuaries would afford to the investigation and registration of causes of death. I need say nothing now about the direct sanitary and social benefits of such buildings. I urge the additional indirect benefit which would accrue from better oppor-

tunities for pathological investigations in decent and proper places. There should be one such mortuary by law in every registration district.

4281*a*. Do you consider that the first of a series of morbid changes which end in death, should be registered as the cause? —I think it unphilosophical, and therefore incorrect, to refer the fatal event to some original ailment or accident, which under other circumstances might have been wholly recovered from. Where there is only one plain cause, a single disease, as small-pox or scarlatina or cancer, the certificate is of course simple and trustworthy; but in long chronic illnesses the last development of disease is the best to record, because it is unquestionable and involves no theory. If the certificate is to be burdened with anterior causes, these I submit ought not to be classified among the published causes of death, but retained as elements of a general registration of sickness. It seems to me that the attempt to combine a record of diseases in the same document with a statistical record of death has been a failure.

4282. Would a general registration of diseases be possible?— I have no doubt that all diseases and accidents attended at the public cost in districts, workhouses, and public institutions might be easily registered at a comparatively small cost. There is in fact already a weekly record made by the surgeons of workhouses and districts, but it is rarely utilized and generally incomplete. Only here and there is to be found some active medical officer, who unearths valuable facts from heaps of schedules, which now are used as waste paper after they have served their fiscal purpose. There are also records kept in hospitals and dispensaries, but in forms not available for general comparison or for statistical use. What we require is a machinery for improving those records and arranging and publishing the facts for local use. The benefit to the community and to sanitary administration would be very great, and would well repay the cost. Those records are better kept, I would observe, in Ireland, where the dispensary and infirmary system includes all the sick poor of the country, and the returns of diseases and of the causes of death are made in the same areas, and generally by officers acting under the same authority.

4283. Do you think that any voluntary system of registration of sickness worked by sanitary associations could supply the public with the required information?—It has been tried again and again, and in some places for a time successfully. For

instance, it is now in operation in Manchester and in Newcastle, but in both those places it owes its success to the indefatigable efforts of scientific volunteers, as Ransome, Morgan, Philipson, and others. In London it was attempted for a year or two, and facts were accumulated to a considerable extent, but the experiment failed ultimately owing to the withdrawal of a small grant from the Treasury for the expense of publishing the returns. The information to be thus obtained is of the utmost importance to the public welfare, for even the imperfect efforts already made show that a serious prevalence of disease may not be synchronous with an excess in the number of deaths. Mortality returns for short periods do not indicate the rise of epidemic storms or the primary results of unhealthy conditions, and they give no adequate sanitary warnings. Sickness returns give those warnings promptly and unmistakeably, but sickness attended at the public cost cannot be registered without public support.

4284. The same statistical areas, namely, unions or registration districts, being ready for the collection and publication of sickness returns as are now used for mortality returns, might not the same officer collect and verify both?—Undoubtedly he might. Unions being almost always identical with registration districts, the medical officers need only be enabled and assisted to complete the information they possess. They might then forward it to the registration medical officer, who, according to suggestions made long ago and now confirmed by Dr. Farr, would verify and correct the mortality returns. The country would thus secure a complete local and timely record of sickness and mortality, and their causes, which would be a record of inestimable value to sanitary conclusions and sanitary administration.

4285. Do you propose to combine registration districts in order to provide areas of sufficient extent to occupy the whole time of a scientific officer?—It would be far better, I think, both in a scientific and in an economical point of view, to combine districts, and thus to form an area of inquiry which would fully employ one officer, than to leave single districts to practitioners involved in the cares and embarrassments and personal responsibilities of private practice.

4286. Would it be possible in your opinion to employ counties or divisions of counties under county management as areas for sanitary inquiry and administration?—I should find it difficult to answer that question without reverting briefly to the historical distinction between parishes and counties, and to the singular

results in which a conflict of centuries between those rival jurisdictions has culminated under the poor law and registration systems. I will refer as briefly as possible to the present state of things. It is well known that, although unions are aggregates of parishes, counties are not.

4287. (*Lord R. Montagu.*) By parishes you mean poor law districts, not ecclesiastical districts?—Yes. I do not use the word parish in an ecclesiastical sense, but in its administrative ordinary sense, meaning a district which has a separate poor rate. According to Mr. Rickman, at least 550 parishes—I mean poor law parishes—in England were known to extend into two counties or hundreds. From a parliamentary return in 1861 (No. 494), we learn that in 46 unions, at least 60 parishes extend into two counties, that is to say, the old county boundaries divide the parishes. So that when unions were formed as they were formed without the slightest respect to county boundaries, unfortunately in my opinion, the result was that no fewer than 180 of the 620 unions extended into more than one county. Here then was the double difficulty, the ancient parochial unconformity with counties and the modern union intrusion upon counties. But the climax of confusion was reached when the Registrar-General constituted a new set of counties which he called registration counties, consisting of aggregates of registration districts. Now if the old historical counties, under county law and government, are to be taken as the basis of areas for sanitary administration, the unions or registration districts would have to be again divided for sanitary purposes, and on the whole I am disposed to recommend that course. The statistical division of 180 registration districts is a less formidable prospect than the surrender of county management and organization, and a less evil than new registration counties. So I would suggest that wherever a registration district is divided by a county boundary, the vital and sanitary statistics of the two portions should be returned separate and carried each to its own proper county. There is no greater difficulty and probably less difficulty in this change than has been overcome in collecting and publishing the recent returns of the precise vital statistics of the 10 great towns which I have mentioned, some of which presented far more serious obstacles to the statisticians, owing to their unconformity with parishes, districts and counties, than might have to be encountered by the adoption of the old county limits. There would be many and great advantages in

bringing sanitary matters under county jurisdiction, especially in the appointment of the proposed scientific officers for sanitary inquiry and advice; but the first step towards an improved administration would be to recognize the registration districts as the areas for sanitary investigation.

4288. (*Chairman.*) Are not several matters affecting the health of the people now administered by the county authority, and might not such authority be extended to other matters requiring treatment in larger areas than those of the existing local sanitary authorities?—That is my conclusion. For instance, the following matters come under county control:—Asylums for the insane poor; prisons, reformatories, &c., requiring sanitary inspection; inquests by county coroners; and inspection of food by county analysts, as in Gloucestershire. County administration might I think be advantageously extended to the conservancy of rivers and watercourses, over which the county has long provided bridges. Wherever the watershed of a river divides a county or includes more than one county, the conservancy authority might consist of delegates representing the precise watershed area, and appointed by the county or counties concerned. County boards or sessions would be very proper courts for the appointment of the proposed officers of health and registration, and the more so since the ratepayers are, I suppose, about to be represented in the financial government of counties.

4289. How would a system of inquiry, record, and scientific advice such as you propose work with the present local authorities?—I believe that there would be less perplexity and greater satisfaction in those relations which would probably subsist between a superior sanitary officer at work in a large district or group of districts, and the various local authorities which might be acting within the boundaries of such district, than in the relations which now exist between the ordinary sanitary officers and the little boards which appoint and control them. Each sanitary superintendent of the larger district would of course be required to supply all necessary information about sickness and mortality, and any advice that might be asked for, to the several local boards and vestries within his sphere of duty. And here I would urge the importance of so constituting the proposed sanitary office as to secure the efficient action of the officer. His qualifications and his duties should be carefully determined and regulated by authority, and his tenure of office should be protected by the Government.

4290. Could the officers of health appointed under the existing law be made available for the purpose of sanitary inquiry throughout the country?—After much reflection upon this point, I feel satisfied that the existing officers of health could not generally be so employed. Some would be unwilling to undertake more onerous duties, in wider areas, with the sacrifice of their other engagements; and the reformed or new local authorities might not be willing to appoint them. But, on the other hand, there are some gentlemen now acting as officers of health in the towns, who would be of the greatest possible advantage to future sanitary progress, as they have gained valuable experience, and some of them much distinction. It is a marvel to me that, under so confessedly bad a system, so large a proportion of good officers should have been secured. I venture to attribute this to the public spirit and philanthropy of my profession. Then there are officers of health under a recent enactment, who need not possess any medical or scientific qualification at all.

4291. What enactment is it that you are referring to?—The Artisans and Labourers Dwellings Act. Of course it would be impossible to employ these in a reformed system. However, I think it is fortunate, and herein I differ from the majority of my profession, that the officers of health under Mr. Torrens's Act need not be medical men, and in fact some of them are not medical men; an obvious deficiency of qualification will leave them to be more readily dealt with under a proper organization.

4292. How would you reconcile existing appointments, and the claims of existing officers, with a general organization, such as you propose?—In cases where it might be considered important to retain experienced and able men in office, arrangements might, I think, be easily made for the personal tenure of existing appointments, at the same time providing for the future amalgamation of their districts, if small, with adjacent territory, which might be temporarily committed to other persons. In some of the very largest towns, for instance Liverpool, where Dr. Trench presides so ably over sanitary action, it would be desirable to commit the registration duties, of which I have spoken, to one or more medical officers, who would act as his statistical colleagues, or as his assistants. In so vast a population (half a million, I believe, is under Dr. Trench's charge) there would be many advantages in separating permanently the statistical and medico-legal duties from those of sanitary inspection and advice.

4293. Would the general organization of scientific inquiries and advisers have to be deferred until the Legislature had determined the extent of the areas to be adopted for sanitary administration?—I think not, for I have already shown that statistical and sanitary duties of a superior order might, even under present circumstances, be readily performed in areas of much wider extent than those of most of the districts now under the management of local boards. It would, I apprehend, be a much shorter course to enable the Government or perhaps the county authority to appoint officers than to consolidate at once local jurisdictions. But I think that Government interference if authorized should only be temporary or provisional. There is one important reason which I beg to submit for appointing the officers in the first place, namely, that the very information which in a year or two these officers would obtain concerning the physical topography and features and sanitary peculiarities of their districts, would afford the best possible guidance to the Legislature in determining the principles upon which improved districts should hereafter be constituted for sanitary local administration.

4294. What difficulties have resulted from the present variety and complexity of local sanitary jurisdictions?—I have repeatedly represented the anomalies and perplexities caused by the present jumble of sanitary authorities. The chaos seems to have been increased by the creation of two classes of sanitary authority, by the Sanitary Act of 1866. In my comments on that Act I pointed out several sources of confusion, and other persons have followed me in exposing the defects of that piece of legislation; Mr. Hutchins of the Privy Council Office, for instance.

4295. Will you state when you published your comments upon that Act?—It was a reprint in Oct. 1866, from the Journal of Social Science. The pamphlet is entitled, 'Comments on the Sanitary Act, 1866.' I beg to leave a copy at the service of the Commission (*delivering in the same*). For instance, how unreasonable is the enactment that, while hospital accommodation is to be provided by the sewer authorities, the carriages which are to convey the sick to those hospitals are to be provided by the nuisance authorities. I admit that a local board may act as both a sewer and a nuisance authority. The sewer authorities are now to provide supplies of medical relief as well as hospital accommodation in the very districts wherein the nuisance autho-

rities, that is the boards of guardians, have for the last 35 years had an organized system of infirmary and medical relief in full operation; and those very boards, that is the boards of guardians, under the Diseases Prevention Act, may be empowered by the Privy Council to extend this sanitary relief and accommodation during epidemics. Here, then, there are two sets of authorities, which it is well known are often in opposition, empowered to do the same work in the same district, each of course ready to throw off the responsibility and to charge the neglect upon the other. The sewer authority may provide hospitals, but it has no staff of medical officers to carry its powers into execution. The nuisance authority has the staff quite ready and daily at work, but it is not empowered to provide the accommodation. So in the important matter of registration, as well as in the established medical relief, the nuisance authority possesses the officers, the materials, and the sources of information, but its hands are now tied, and the new sewer authorities or local boards are to do the work, for which, in general, they possess neither machinery nor information. The new powers given to parish vestries have to my knowledge been pleaded by boards of guardians as the reason for not doing their customary duty as sanitary authorities. Satisfactory sanitary progress is next to impossible while there is this divided local responsibility.

4296. In what manner would you propose to combine those various sewer and nuisance authorities so as to consolidate local administration?—It is of course not within my province to suggest the legal methods of such combination or consolidation of authority; but I have already said that the spheres or areas proper for a more comprehensive sanitary administration would be more fitly determined after a scientific staff had been at work for a short time throughout the provincial districts. When those areas shall have been defined, I do not see why a principle which is in operation in the metropolis should not be extended to the provinces, namely, that every local board of whatever kind which may be in existence within any such extended areas should send delegates to the higher court which would be established for the sanitary management of that area. This would still leave many details of work to be done by the minor authorities in their own special localities. Or again, local committees might be appointed by a general district court, that is a court for the management of the whole area, to direct strictly local works, the cost of which

would fall upon the inhabitants of the locality only. I imagine, not being a lawyer, that there would be no difficulty in harmonizing the fiscal and the official portions of such an organization.

4297. What is your opinion of the present medical department of the Privy Council as the completion of the general scheme of organization which you have suggested?—Notwithstanding the great and noble work which that department has done in sanitary administration, and is still doing, I do not think that, by itself and unless combined and consolidated with other departments of the Government which have sanitary functions, it ought to continue as the sole sanitary authority of the country.

4298. Do you think that it would be more efficient for general public sanitary purposes if it were connected with the Home Office department, a portion of which is the Local Government Act Office?—I should think not; I should be glad to see all those departments of Government which have to do with sanitary work, either sanitary inquiry or sanitary administration or sanitary works, combined in a single board of health.

4299. Do you mean something similar to the old board of health?—Something very much superior to that in every way.

4300. Which are the departments which you would propose to combine?—There are two main departments which at once occur to me, namely, the medical department of the Privy Council and the department of local administration under the Secretary of State.

4301. Do you propose that they should be combined?—Yes, for sanitary objects. I should hardly like to answer the question respecting any other central authorities unless I had more precise information with regard to the duties which they severally perform or superintend, but I know that there are several other central authorities engaged more or less in medical or sanitary work, one especially of great importance, namely, the General Register Office in connexion with the registration of the causes of death. I think that that department should be represented in any general or central sanitary authority. So, also, ought the Poor Law Board in its medical department.

4302. I gather generally from your last two or three answers that you think that some central medical authority in London is necessary to complete the organization that you propose, and that it should be combined as much as possible with the Local Government Office?—I think I may say yes, although in answer

to the last words of the question 'combined with the Local Government Office,' I would rather say that it should be combined with the Privy Council Department.

4303. I do not suppose you mean to imply by that that you see anything in the Privy Council Office particularly advantageous to the connexion of the medical council with it?—It appears to me that the Privy Council, with its able medical officers, has done more for the cause of public health than any public body in this country, and that, therefore, it is the very best of all departments to be at the head of sanitary action, it being aided by such other departments as have now sanitary work to do.

4304. (*Earl of Ducie.*) Would this improved sanitary organization which you have sketched out lead to any very great additional expense?—There would be an immediate increase of expense doubtless, but I believe it would be amply repaid by the saving to the country of the cost of sickness and mortality.

4305. Could you, do you think, in the country districts find medical officers competent to carry out the improved sanitary administration which you recommend?—I think that even now, the experience which many eminent officers of health have gained would qualify them for forming members of a new sanitary organization, and perhaps for completing it. If not, the number of scientific men who are entering upon that line of study and of practice is increasing every day, and I cannot doubt that in a very little time a sufficient number of men will be found quite capable of undertaking all the duties which would belong to such an organization.

4306. (*Mr. Hibbert.*) I did not quite understand whether, in combining the matters connected with health which are now under the Home Office and those which are now under the Privy Council, you meant to combine them under one or other of those departments, or whether you meant that there should be a new department, forming a public health department?—I should prefer the latter course, but I really do not feel competent to give a precise answer to that question, unless I knew more of the working of the central departments.

4307. You stated that medical men were not required now to give a certificate on the death of any person, but that they very usually did so; what course would you recommend should be adopted in any improved law with respect to that?—I would not subject medical practitioners to any additional compulsion.

I think the present system in that respect is the best; they are morally and professionally bound to render the information, but I would not have them legally compelled to do it as in Scotland.

4308. At present the law is that some person present at the death or the occupier of the house is compelled to give the particulars of the death to the registrar; do you see any improvement upon that?—With respect to the deficiencies which I have already pointed out, I should say that, where sufficient information is not rendered by the medical attendant, it had better be supplied, on inspection, by a skilled officer of health and registration, or by his deputy. I think that would meet the whole difficulty of the case.

4309. In the case of a person dying who was not attended by any medical man at all, how is the cause of death certified?—There should be the evidence of inspection, and the inspection should be, in some respects, such as is the case all over the continent.

4310. But now that it is not necessary to have any such inspection, how is the cause of death ascertained in order to be placed upon the certificate?—It is sometimes not certified at all under the present system, as I have already explained. 4,600 deaths occurred last year in the country, respecting which the causes were not even specified, still less certified.

4311. Still I find in the schedule to the Act that there is one column for the cause of death to be stated in the form of the schedule which requires the death to be certified, is that the form in which it is obliged to be certified by the registrar?—There is no compulsion to fill up that column by information certified by a medical officer.

4312. I want to know whether you can recommend any improved form for obtaining the cause of death in order that such a column should be filled up?—I thought I had explained the process which I would recommend for the better return of the cause of death. I think that if there were a public officer whose duty it would be to inquire into and to return that cause, there would be fewer omissions on the part of those whose duty it is to fill it up, and if, after all, such omissions occurred, he would be the officer to supply them.

4313. That officer could only be able to supply it, I presume, after having taken evidence as to the cause of death?—He would go to the house where the corpse lay, and make the best inquiries he could, and state the cause as nearly as possible; and if

he conceived that the circumstances required a coroner's inquest, he would immediately inform the coroner of the district, and the cause of death would be legally and judicially investigated.

4314. (*Mr. Powell.*) Do you mean where there was a doubt as to the cause of death, or where there was a doubt as to whether the death was a violent one?—I ought to have used the word 'suspicious' in describing the death which would be investigated by a coroner's inquest.

4315. (*Mr. Hibbert.*) You state that the death-rates at present are fallacious. I suppose you mean that they are fallacious in comparing one town with another; they are not fallacious in comparing the death-rate of one town in one year with the death-rate of that same town in another year, are they?—I think the same sources of fallacy which I have pointed out in my previous answer would apply to successive observations in the same place, though perhaps not to the same extent as to contemporaneous observations in different places.

4316. Would you not have very much the same class of people living in the same place?—Perhaps so; but their ages might differ materially, and great movements of population might have intervened.

4317. Have you given your attention at all to the places in which high death-rates prevail, for instance, Manchester, Salford, and Liverpool, and can you state any cause of the high death-rates in those three towns?—I believe the causes of those high death-rates have been thoroughly investigated by scientific local inquirers on the spot. I should be very sorry to give an opinion on that point after such clear inquiries and reports as have been made by Dr. Ransome and Dr. Morgan, which I think are full and satisfactory as to many of the causes of high death-rates in Manchester.

4318. I understood you to say that you thought that there was some difficulty in providing county control for sanitary matters, owing to, in many instances, unions running into two different counties. I do not know whether you are aware that there are two bills now before the House of Commons, one providing for a county administration of finance, and the other providing for a county assessment, in both which bills those difficulties have been overcome?—Of one of the bills I was aware, and I alluded to it in my answer; I was not aware of the other, but I am glad to hear that such a measure is intended.

4319. If those difficulties could be overcome you would see no

objection to having a county control over sanitary matters?—Not the least.

4320. (*Lieut.-Col. Ewart.*) What would be your opinion with regard to sanitary organization as to what should be the unit—should you make the ecclesiastical parish the unit of organization for sanitary matters?—It is a question that I am unable to answer. I am not fully aware of the difference between an ecclesiastical parish and a poor-law parish. When I used the word parish, I referred entirely to parishes or districts which are rated separately to the relief of the poor.

4321. The ecclesiastical parish being represented by the vestry, would you make the union or the vestry the unit for sanitary organization? — By 'parish' I mean that district which is governed by a vestry and rated separately, whatever it might be called.

4322. And you would have the sanitary organization in connexion with that vestry?—The district governed by the vestry would be the unit to be combined for sanitary organization.

4323. What class of inspectors for sanitary purposes would you think desirable for that unit?—The class of inspectors for extensive combinations of parishes or unions, concerning which I have offered some suggestions to-day, would be medical men of high education, of an education superior to that which has been hitherto demanded of the general body of medical practitioners. I may be permitted to say that that question is now before the General Medical Council of Education, which will be asked to provide a higher qualification for officers of health and other medical men engaged in various departments of the public service.

4324. But for the detailed inspection which would be under their general supervision, what would be your opinion as to employing say the county police?—My impression is, that the county police are a most valuable body, and would be very serviceable in the performance of such duties. My only question would be this, but perhaps I have not sufficiently considered that matter, whether the employment of the police in sanitary inspection would be repulsive to the feelings of the population of the country, although I have no proof of such a feeling existing.

4325. How far do you think that the coroners could be made available for carrying out the system of registration to which you have alluded, or how far could the two duties be combined in the same person?—That is a very important question indeed,

and one which I have considered; but my impression is on the whole that the coroner should still continue to be the judicial authority, and that it would be better that the coroner should be aided by a medical officer of registration, than that the legal and the medical functions should be combined in one officer; in other words, I do not think that a medical man would necessarily, however highly qualified, make the best coroner.

4326. You are aware that at present investigations in important cases are carried on either by the medical department of the Privy Council, or by the Local Act Office of the Home Office; do not you think that it would be often of advantage that you should have an important inspection of that kind made by two inspectors rather than by one inspector, which might be the case if you had a central office?—I can conceive that there would be cases where the opinion, after consultation, of two gentlemen, one, we will say, a physician, and the other an engineer, would be of great value, and their report would be better than the report of a single officer; but I think that, with such an organization of medical officers as I propose to be established in the country, there would be far less necessity for incurring the expense and trouble of sending one or two inspectors from the metropolis on all serious occasions of epidemic sickness; in other words, the duties which devolve now upon the inspectors of the central office would be diminished by the organization which I propose.

4327. (*Sir T. Watson.*) I gather from the answers which you have given to the last questions that you would hardly consider in the sanitary organization of which you have been giving a sketch, that any part of it should be administered by medical men who are gaining their daily bread by their daily practice?—That is my opinion.

4328. You would have the sanitary organization consist of men who are trained for that purpose only, and who should be prohibited from what we call the practice of physic?—I would do so for the future, but I should be very sorry if any enactment were passed which had the effect of dismissing from office the men who, on other terms and with other tenures of office, are for the present doing so much good in the country. I would make any such regulations applicable to the future only.

4329. You are familiar, as the Commission are aware, with the sanitary enactments which are at present in force; do you think that they recognize almost all the preventible causes of disease,

or that there are any which are not recognized by those Acts?—There are a very great many that are not recognized at present.

4330. So that the inquiry is not simply how to provide against the evil, but what the evil is that is to be provided against?—That is my opinion, and for that reason I commenced my evidence by showing how extremely important it was that we should have a better registration of sickness and its causes in the country as a foundation for sanitary organization.

4331. Is it not extremely desirable that the presence of any new cause of preventible disease should be instantly discovered and announced?—It is of the utmost importance.

4332. Have you thought of any plan by which it could be secured that the presence of disease in a place, or the threatening of disease, should be at once discovered, reported, and a remedy provided?—I intended that a previous answer should have suggested the importance of such an arrangement. I believe that if there were a medical officer of health and registration in every large district, to whom all deaths and cases of sickness were returned promptly by those persons whose duty it is or would be to record them, he would be in a position immediately to announce the prevalence of any serious cause of injury to the public health, and so to promote its removal.

4333. (*Dr. Acland.*) I think I gather upon the whole from your evidence that your wish is to have one great central office, and a complete system of competent resident inspectors over considerable areas?—That is a very fair sketch of the plan which I would suggest.

4334. One central office comprising all the important health departments now existing, others if necessary, and in addition to that competent inspectors?—Yes, local inspectors, medical officers of health and registration.

4335. Could you give the Commission any opinion as to the value of the poor-law system of this country for such a purpose?—I believe that no efficient sanitary system could be established without making use of the poor-law medical staff of this country. I have thought very much on that point. Already the medical officers of districts and workhouses are brought face to face, not only with the results of unsanitary conditions, but with the causes, and I think they ought to be employed very largely in sanitary inquiries. I mean to say that the poor-law medical officers ought to be made use of very largely in any such system as I have suggested. I would place them in connexion

with, though not exactly as subalterns to, the local inspector. I would require them to render him all possible information, working with him and acting as his assistants when, owing to the size of his district, he could not accomplish every particular of sanitary inspection. They would in fact be the assistant sanitary officers of the large district over which there would be a medical officer of health and registration, as local inspector.

4336. It has of course been noticed by you that the poor-law officers of this country in the rural districts generally are in fact the sanitary officers?—They are at present, that is the fact.

4337. Are they not inspected by both legal and medical inspectors at this moment?—They may be, but not in the way in which they would be aided and superintended by the organization which I propose, which would perform duties different altogether from those of the present poor-law inspectors.

4338. Would it be troubling you too much to say what are the functions which you think should be committed to those medical inspectors?—I should be unwilling to make a statement now which might be considered to represent completely my views respecting the duties of those officers, but I should be willing, time permitting, to prepare such a statement for the Commission.

4339. It would seem to be very desirable, in order to get precise notions upon this subject, that we should realize exactly what should be the functions of inspectors of this kind. There are at the present moment, as you are aware and as you have stated, many recognized sanitary wants; the question is whether the inspectors are to be the supreme judges of the mode of meeting those wants. They might superintend the registration of deaths, the registration of disease, the inspection of food, and the like. Would you add to their duties the supervision of medico-legal inquiries?—Not as coroners, but as officially affording the information which I have said is so often necessary respecting suspicious deaths, after a careful examination of the body.

4340. Is there reason to believe that at present the medical officers who are appointed by the poor law all over the country are appointed with a view to discharging duties of that kind?—I think they are not; that is not their main function.

4341. But, notwithstanding that, is it within your knowledge that, although not appointed for that purpose, they practically are constantly required to discharge that duty?—Not, I imagine,

all the duties which I have suggested, or which you yourself have suggested, but they are qualified for and may be employed in many useful sanitary duties, and they might be trained for the performance of duties of a higher kind by acting as assistants to the superior officer, whom I propose to be appointed over a very much larger district.

4342. Is there any published statement as to the duties to be imposed upon such inspectors?—I have suggested a number of duties to be done by him, but I am not aware that a complete category of the duties has yet been prepared. Already we have two important official papers on the subject; one by Mr. Simon, prepared for the late General Board of Health in 1855, and entitled, 'Instructional Minute relative to the Duties and Qualifications of Officers of Health;' and the other paper is a letter from Dr. Farr to the Registrar-General, which is contained in the Twenty-seventh Annual Report, in which he treats of those duties which would belong to a medical officer of registration. The combination of those two classes of duties would make a tolerably complete list of the duties which should be required of this officer of health and registration, whom I propose for every large district in the country.

4343. I think I gather that your system would be to have paid officers of health and registration in every district?—In every large district.

4344. Those being persons educated for the purpose and not in practice?—Yes, but I would always provide that existing tenures of office should be respected.

4345. Do you think that persons not engaged in practice would be the best class of persons, or a good class of persons, for pathological and toxicological inquiries?—That is a very important question, and I am glad that you have given me an opportunity of expressing my opinion on the point. I consider that no one should fill such an office as I have proposed, unless he had been engaged in the curative practice of his profession, and particularly in those scientific pathological studies which best prepare a man for practice, for a sufficient period before he were permitted to undertake the duties of a sanitary officer. And I would add to my answer, that I do not think the appointment of physician or surgeon to a hospital, or to any great institution of that kind, wherein men of high ability give their opinions for the benefit of the poor, would be at all incompatible with the duties of an officer of health; but I do not think that

the duties of curative practice among private patients are incompatible with the proper and independent functions of such an officer as I propose.

4346. You see a consequence that would follow from that. If the officer of registration and health be also allowed to be physician or surgeon to a hospital, and allowed therefore to exercise his high skill upon the poor, you think that it would be improper that he should exercise the same skill for the benefit of those who could pay for it?—I think that his position would be altogether altered directly he went into the field of competition for private practice; and I would beg to illustrate my opinion by referring to the position of the distinguished medical officer of the Privy Council, who to this day is a surgeon to St. Thomas's Hospital, and performs his duties of that appointment with great *éclat* and benefit. I should be very sorry if any enactment were passed which would deprive St. Thomas's Hospital of Mr. Simon's advice, but I understand that Mr. Simon does not practise privately, and I think that I am justified in saying that he would decline to undertake any private practice whatever, while medical officer of the Privy Council.

4347. It may be of comparatively little consequence in a great metropolis, but it is well known that the amount of operative surgery in provincial districts is not great, and this provision might make it impossible by law, might it not, for the best surgeon, it might be of a country hospital, to operate upon any excepting poor persons?—The Commission will understand that I answered the original question conditionally. Supposing that there were an officer already, either a physician or a surgeon, at work in any hospital, that occupation should not be a disqualification for his undertaking the office of health and registration, provided he consented to relinquish private practice. At the same time I am bound to say that such cases, I believe, would be very rare indeed in the provincial districts. Dr. Trench, of Liverpool, who is debarred from private practice, has assured me that he is satisfied to be altogether removed from the necessity of attending to private practice, as he felt that it would be quite incompatible with his public duties.

4348. Is he physician to the Liverpool Hospital?—I believe that he is not; but he does not undertake private practice. I do not suppose that all the officers of health and registration whose appointment I am recommending would be physicians or

surgeons of hospitals, far from it. I think very few would be. The question is, whether they should be absolutely debarred from holding such hospital appointments, and I am disposed to think that they should not.

4349. I notice that, in your valuable work on State Medicine, you make an estimate of the number of districts, and the number of such officers as would be required, and you perhaps may remember that that number is stated at about 300 for England and Wales; or one for each population of 60,000?—It is so; but on further consideration (that work was written 15 years ago) I recommend that the districts should be larger, and I think that a district containing from 80,000 to 100,000 persons might be very well inspected by such an officer as I have proposed.

4350. You are known to have paid great attention to the system of State Medicine on the continent; would it be convenient for you to offer now to the Commission any sketch of the best sanitary organization in foreign countries?—I should find some difficulty in answering that question, if I were required to state which of the continental systems I think the best, for I consider that they all have serious defects, and are besides in themselves all of them more or less inapplicable to this country. The office of *kreis-physicus*, or district physician, was first instituted in various states of Germany more than a century ago, and it still exists; but it is allowed to be exercised by persons who are in private practice, and the result, as I am informed and as the general medical council is informed, is that the duties are not so satisfactorily performed as they would be were those officers debarred from private practice. I am sorry to say that I cannot give the Commission any sketch of foreign systems immediately. I believe it to be contained in an incomplete work which Dr. Acland has put into my hands, which contains replies from some of the most eminent men in Germany on that subject. From those replies it would be easy in a short time to draw up a sketch of the duties which the German district physicians perform.

4351. You have alluded to a document which I have just shown you; could you say whether it would be easy for the medical council, which is charged with superintending the future education of the medical profession, to lay down such an education and qualification, until it knows what the Government is likely to arrange with regard to the areas of inspection, and therefore the salaries to be paid to those gentlemen, and therefore the different kinds of qualifications which may reasonably be

required of them?—I should have thought that all the necessary conditions of qualification for a high sanitary or medico-legal office could be judged of and determined by the general medical council independently of any action of the Government at all.

4352. I would suggest this difficulty, that if the medical council established a high class of state medicine diploma and tempts young men to follow that line of life, and then this Commission or the Government should declare that no such office should exist and no such salaries be forthcoming, it would be a kind of breach of faith with those young men?— I imagine that a young man would enter upon that line of study with very much the same views as one who goes to the university and lays himself out, if he is intelligent, industrious, and ambitious, for the highest honours which the university can bestow upon him, and yet it may be that in after life he has very little opportunity of turning those high honours to account. I do not imagine that many are debarred from obtaining the honours from a doubt in their minds as to the possibility of deriving profit from them. They go in for the highest education and the highest honours that they can obtain, and no doubt they are generally rewarded, but far from always.

4353. Therefore the present voluntary system would probably answer in your opinion?—I should say so, supposing always that a high and special qualification were instituted, and that the terms and tenure of office were properly settled.

4354. Would you compel the local authorities to appoint and to pay sanitary inspectors?—I have not made up my mind as to the sources from which the remuneration of those officers ought to come. I think that the county rate upon the whole would seem to be the most proper source for their remuneration; certainly not a union or a parochial rate; it should not be charged on a merely local rate; it should be an expense distributed over as large an area as possible; but whether it should be a charge on the county rate, or on a national rate to be made for that purpose, or upon the consolidated fund, is really a question for a politician rather than for a medical man to answer.

4355. Have you considered the question of the amount of salary?—I have. I think that such officers as I propose ought to be remunerated at the rate of about 1*l.* annually for each hundred of the population, which is a tenth of a florin per head; but whether that remuneration should be in the form of a fixed salary only, or whether a part of it should be constituted by

certain fees to be paid to them, as in Germany, for the performance of certain duties, I am not sure. I am inclined to recommend that a moiety of the proposed remuneration should be in the form of a fixed salary, say 500*l.* for an extensive district, leaving the remainder to be made up by special payment for special work.

4356. Do the so-called certifying surgeons discharge sanitary functions in this country?—They are expected to do so by a circular of Mr. Inspector Baker's, but it is now a question whether they ought to perform those functions or not. Two different statements are before me, within the last 24 hours, on that very point. I believe that they have sanitary functions to perform, and I believe it is important that they should perform them, but whether to the extent required by Mr. Inspector Baker or not, I do not presume to say.

4357. Are you aware that the guardians have at present power to obtain sanitary reports on any district, and to pay medical officers for so furnishing them?—I am aware of that.

4358. Do you know whether they exercise that function?—I believe very rarely; but I have heard of their so doing.

4359. I think I may gather from your evidence and other evidence that we have a great deal of organization, the principles of which require reconsideration as well as rearrangement?—I do think so.

4360. We have a considerable machinery, very complicated, and often conflicting?—It is quite so; and I would add, that there are a great many persons employed in various public functions within a wide extent of country whose total remuneration for those duties, as now paid, would go a very great way towards the fund which would be necessary for remunerating the proposed medical officer of health and registration.

4361. From your great knowledge of both foreign and home arrangements of this kind, do you think that there is any prospect, without completely recasting our system, of getting a reasonable sanitary organization established in this country?—I do not think it possible without that.

4362. (*Mr. Richards.*) You have spoken of an officer of health and registration; do you mean the county inspector to fill that office?—I am now proposing only one class of officers, and they would be medical officers of health and registration. Each officer might superintend two or more registration districts, and

might be appointed by the county authority or by a reformed system of local boards. I prefer the county authority, because that is an established authority, and can at once act, I presume.

4363. To take an example: in a large town of 60,000 inhabitants, would the gentleman whom you would appoint as the medical officer of health take his instructions from the county authority?—Provided that the county authority were fortified by including representatives from the local boards or from the ratepayers.

4364. Do you think that it would be likely that an officer appointed in that way would work so harmoniously with the local board in a large town as if his appointment came from the board itself?—Perhaps not; and I would make an exception to my last answer in the case of very large towns, which are sufficient of themselves to employ the entire time and services of one medical officer of health and registration. In such cases I do not see any necessity for depriving the governing body of that town of its present powers in such an appointment. I have been speaking more particularly of districts which do not possess the means of governing and managing a large population.

4365. Will you give us a definition of a large population?—I have said that I thought that the average population entrusted to one of those officers should be from 80,000 to 100,000.

4366. Assume the case of a town of 60,000?—If in that town at present there were an officer of health usefully at work I would by no means displace him.

4367. Assuming that there was a town of 60,000 inhabitants without an officer of health, would you by your scheme give the appointment to that town, or would you give the appointment to the county?—I would give the appointment to that town solely, if the town were willing to raise a salary which would render that officer independent of private practice; and my reason for naming the higher amount of population is, that the pecuniary burden of the system would be less felt in a larger population, whilst in a population of only 60,000, the charge might be felt to be too onerous.

4368. Would you insist in all cases that the registrar of deaths should be a medical man?—Certainly not.

4369. Assuming that information were brought as to the death of a person in the district, how would you provide for the information that I understand you to require of the registrar

previous to certifying a death where full information had not been given by the medical attendant?—The registrar would report that case at once to the medical officer of health and registration, and the latter would make the proposed inquiry.

4370. What chance would there be of an examination of the deceased by the local inspector, assuming that he had a district of 100,000 covering a large area of ground?—In the majority of cases he would be able to perform the inspections; but I will suppose the case of his being at one end of a large district when he might be summoned to inspect a death at the other end. I would say that the difficulty in such a case would be met by employing the medical officer of the union as his deputy until he were able himself to confirm or verify the report.

4371. Would you have the medical officer of the union subject to instructions from the local inspector?—I would have him form part of the same system; he should co-operate in every case with the district officer of health and registration; he would be in the position of an assistant. As has been shown in answer to the question asked me by Dr. Acland, he is now virtually a sanitary officer, and he would not be deprived of, or prevented from exercising, any of those sanitary duties under an improved system. He would be assisted in performing them, and he would himself render further valuable assistance to the higher officer whom I propose.

4372. Would you in every poor-law district have the medical officer of the union a part of your machinery?—Yes, I would make him a part of the organization. I would collect a certain number of medical relief districts under one medical officer of health and registration, an aggregate of districts for medical relief and an aggregate of districts for registration. Two classes of facts, as I have before explained, would then come under the local supervision of a highly qualified officer, who would make use of them for sanitary purposes.

4373. Would you make it incumbent upon the medical officer of the union to report to the local inspector upon all cases of sickness as well as mortality?—I would, certainly. That is a most important feature of my plan.

4374. As I understand, the base would be the medical officer of the union and the registrar, both reporting to the district inspector; whose duty would it be to make returns of sickness and mortality?—The returns of mortality would be made by the registrars to the medical officer of health and registration, and

the returns of sickness would be made to him by the poor-law medical officers of the district, and I would submit that other returns of sickness might be collected from public institutions, hospitals and dispensaries, which might exist within the district.

4375. Do you think that public advantage would necessarily be gained by making the medical officer of the union the registrar of deaths?—I do not think it will be attended with any public advantage.

4376. Assuming the inspector had had returns of an undue amount of sickness made to him by the medical officer of the union, and he made representation to the district authority, and they were utterly indifferent to his representations, would you give him any power to act?—I would not; I would particularly guard against the idea that I wish to institute a medical despotism in this country. I believe that the carrying into effect local sanitary measures must rest with the local authorities themselves, under the control of such central department as has been suggested to-day; but I consider that the functions of the high-class officer whom I recommend would cease when he had given his advice, and the responsibility of acting upon that advice would rest with the authorities.

4377. Assuming that the board of guardians were constituted the local authority in rural districts, and they were utterly indifferent to his representations, would you still be content that his report should be given to the guardians, and that no other action should be taken by him?—I should not be content with that, because I propose that his report should be forwarded in every case to the central authority; and the central authority, on receiving information that the advice of the officer had not been attended to, would probably proceed, as the Secretary of State now proceeds, to enforce the provisions of the Sanitary Acts, whatever they might be.

4378. In reply to one question of Dr. Acland's as to the number of officers who are now in one way or other engaged officially through the country, you say that you think a consolidation of their duties might be effected without any great increase of public expenditure; will you give us a few examples of the officers to whom you refer?—Without pledging myself to the completeness of my answer to this question, there are several kinds of public duty now performed, which I think in time might be consolidated with great public advantage and economy. The one is medical evidence, after skilful and thorough *post mortem*

examinations, and perhaps analyses, at coroners' inquests, so far at least as those inquests are held on the bodies of the poor and the unknown of the population, which constitute the great bulk of the persons upon whom inquests are held. I would not displace the medical attendant or the private practitioner from any duty which he may at present perform at those inquests, but I think it would save public money if certain medico-legal duties, which are now paid for out of the rates, were committed to the proposed officer or his deputy. That is one class of duties. Another would consist in duties which are performed by certifying surgeons of factories, and I think that, on the vacation of office by any one of these gentlemen, all the sanitary functions which he is now expected to perform, and perhaps his medico-legal functions also, might be performed under such an organization as I propose. Then there are also scientific duties to be performed in every populous district, with respect to the food of the people. I do not mean mere inspection of markets and slaughter-houses and pigsties, because such places may be inspected and reported on by any intelligent person, for instance, a policeman. But in the analysis and microscopical examination of foods and drinks and medicines, a skilled officer, protected by public appointment, is quite necessary for the public health. It might not be possible for the superior officer of health to undertake these examinations in a town of vast size and population, as Manchester or Birmingham. In such places the analytical duties might be left to a county analyst, who perhaps need not be a medical man. But in ordinary provincial districts, where there might be no analyst appointed under the Adulteration of Food Act, it would obviously be an advantage if the proposed medical officer of health and registration, or one of his deputies, could perform these duties. Again, I have elsewhere shown how certain local duties in the department of public vaccination, especially the inspection of vaccinated patients for purposes of certification and registry, for the advantage and security of the public, might be committed to the proposed superintending medical officer. By such a measure, much of the labour bestowed on this department by the inspectors of Privy Council might, I believe, be spared. I am well aware of the very great improvements in public vaccination which have been effected under Privy Council inspection. I have no wish that such inspection should be superseded, but it might be aided by skilled and independent local inspection, and thus a numerous staff of central inspectors

might be rendered less necessary. Another class of public functions which I think might be committed to such officers are such as are now, I believe, performed under the Contagious Diseases Act, in garrison towns and sea-ports, a system which is being gradually extended to other towns, and the principle of which I hope may be extended to the civil population of the country generally. That would bring in another very important class of duties to be performed by the proposed officer or his deputy. I am not prepared at present to extend this list.

4379. Has your attention been directed to the possibility of the district or county inspector having the supervision of lunatic inspection?—It has. I think that the duties which are now performed by the visiting physician to the justices might well be performed, and indeed much better than at present, by the proposed officer. I might have added these duties to those mentioned in my last answer.

4380. I understand it to be one condition of your recommendation that the Registrar-General's department should be combined in future with what is usually known as the local government department and the Privy Council department?—The sanitary functions of the Registrar-General's department, and those only.

4381. (*Mr. Powell.*) You stated in an early answer that many of the officers of health appointed under Mr. Torrens's Act are not medical men. Are you aware how many have been appointed under that Act?—I am not; but I have heard of several not having a medical qualification, who were held to be officers of health under that Act.

4382. Do you mean that they were appointed by the Act?—The Act has specially omitted the medical qualification. It was proposed by some members of my profession that the officer of health should be a medical man, but Parliament declined to endorse that recommendation, and now the officer of health may be either a medical man, or he may be a sanitary inspector, as it is called, or an inspector of nuisances. I am informed, upon what I consider to be good authority, that many such inferior officers are officers of health under this Act.

4383. But your mind runs entirely to the special provisions of Mr. Torrens's Act of last session, and not to the general provisions of the other Acts of Parliament on the subject?—My remark applied solely to Mr. Torrens's Act.

4384. Under the Public Health Act, the officer of health must

be a qualified medical practitioner, must he not?—He is there called the medical officer of health, but that term was purposely altered in Mr. Torrens's Act; in the latter he is only called officer of health, and it is not necessary that he should have any medical qualification whatever.

4385. The words of the Public Health Act in the 40th section are these: 'And be it enacted that the local board of health may from time to time, if they shall think fit, appoint a fit and proper person, being a legally qualified medical practitioner or member of the medical profession, to be and to be called the officer of health.' The word medical has been imported in the conversation, but it is not in the Act?—I submit to that correction. I meant that it was expressed in the Public Health Act that he must be a medical practitioner or a member of the medical profession.

4386. You think that any person acting as an officer of health ought to be a duly qualified medical practitioner, and you regret the relaxation introduced, to a certain extent, by Mr. Torrens's Act of last session?—I cannot answer that question quite as you might expect, for I have already said that I consider it fortunate that a medical qualification has not been required in Mr. Torrens's Act, because the want of such a qualification will make it very much more easy to deal with those inferior officers in any improved medical organization under officers who may hereafter be appointed over wider districts. I will explain myself further. By Mr. Torrens's Act, every town of 10,000 inhabitants must appoint an officer of health. I consider that if every officer so appointed was to be a medical man, the Act would raise up a body of medical officers of health in the country having vested interests, whom it would be difficult afterwards to reconcile with such a reformed and improved system as I recommend; and I therefore consider, although I am aware that my opinion is opposed to that of many medical men, that it is a fortunate thing that the medical qualification was not insisted upon.

4387. At present the law then now stands thus: that in all towns above 10,000 inhabitants there must be an officer of health, not necessarily a medical man?—Exactly.

4388. But under the Public Health Act they may or may not appoint an officer of health, but the officer appointed under those former Acts must be a duly qualified medical practitioner?—Quite so.

4389. You stated, and in that you correspond with Dr. Trench of Liverpool, that it would be well to appoint colleagues or subordinates; how many would you suggest for such a town as Liverpool?—When I said that if a medical officer of health and registration, or any number of such officers who might be considered necessary for a town of the size of Liverpool, were appointed, I meant that they would be in the light of statistical assistants to Dr. Trench. It was a conditional answer. I did not propose positively that he should have so many assistants, but that if the proposed staff of officers which I recommend were appointed, they would be in the relation of assistants to an officer in Dr. Trench's position over half a million of persons.

4390. But is it part of your scheme that in such a town as Liverpool Dr. Trench should act alone, or that he should have colleagues or subordinates in so large a community?—I believe that it would be quite impossible in so large a community for Dr. Trench to perform all the duties which I propose to be performed by those officers; therefore I am sure that he must have assistants if that plan were fully carried out.

4391. You said that the district inspectors should be medical men of high education; of course we assume that they would be men of superior education, but their education would rather be of a special character than of a very high character?—It would; it would be both high and special. For instance, in physiology and pathology they would require to possess more than ordinary qualifications; but then, in addition to those qualifications in physiology and pathology, they ought to possess certain special qualifications, particularly a thorough and practical knowledge of hygiene and sanitary laws.

4392. Do you propose that the central authority should have itinerating inspectors medically educated?—I very much question whether the central authority could act beneficially without a few such inspectors, but I think only a few would be necessary.

4393. What number, speaking roughly, would you suggest?—To take the present constitution of the Privy Council Office, I believe there are at least four permanent medical inspectors, and I think those four gentlemen, or whatever number may now be employed, would be quite sufficient as itinerating inspectors.

4394. I understand you that you consider the duties of the medical representatives of the central authority would be rather moral and suasive than coercive?—I consider that, on the repre-

sentation of an inspector, the central authority ought to have power to compel the local authorities, who may have neglected the advice of their district officer, to do their duty.

4395. You leave the medical representative with coercive power behind him?—Yes.

4396. And you would place the appointment of those gentlemen in the hands of the Government?—Yes.

4397. Both of the district inspectors and the officers of the central department also?—I would leave, I think, to the Government the appointment of the first medical officers of health and registration, but these ought ultimately to be chosen either by the county authority or by reformed local boards. I particularly retain these two alternatives, for I am not sure which would be best.

4398. Do you think that the central authority ought to have the power of defining the duties or the salaries of the district inspectors?—I think that it ought to have the power of defining the duties, and I think there should be some general rule with regard to the salaries.

4399. Would you invest in the central authority the power of fixing the minimum?—I think it would be well that it should have the power of insisting upon a minimum.

4400. Would you empower the central authority to dismiss?—I would, and I would give the power of dismissal only to the central authority.

4401. I think you have already stated that you would ordinarily make the district coincident with the county, and that payment should come from the county rate?—That seems to be upon the whole the best plan, always supposing that the county would be divided into districts, according to registration districts, single or grouped or divided; but I am aware that this is a question still open to consideration.

4402. As regards the smallest medical authority, using the word small with reference to area, I think you recommend that he should be the medical officer of the poor-law guardians?—That officer would continue to be what he is now, a sanitary agent.

4403. If there were a local board appointed for sanitary purposes, independent and irrespective of the guardians, would you place him for sanitary purposes under that local board, and for poor-law purposes under the guardians?—I am hardly prepared to say how such divided responsibility would work.

4404. Does not that suggest very serious difficulty in the employment of the medical officer of the guardians for sanitary purposes under a sanitary board?—I do not think that the difficulty would be insuperable.

4405. Do you think that one man could well serve two masters?—I believe that at present the medical officers of unions have certain duties to perform for which they are not responsible to the guardians, but I am not sure.

4406. At present you know that the guardians are the nuisance authority, and it is as the servants of the nuisance authority that they have their sanitary powers?—Yes. I cannot speak now from precise knowledge, but I believe that for some of the more important duties, for instance, vaccination, they are not wholly responsible for the performance of those duties to the board of guardians. I speak under correction.

4407. But, assuming that there is at the present time in some exceptional manner a division of authority over those medical gentlemen, and no inconvenience arises, it by no means follows that considerable inconvenience would not arise if you were to increase their duties and place them under two different governing bodies?—Perhaps there might be some such inconvenience; but it appears to me that their sanitary duties would form a class of functions so distinct from their ordinary duties as medical attendants of the poor, that while they were performing the one for the board of guardians, they might perform the other for the amended sanitary authorities.[1]

4408. There would not necessarily be any communication between the Poor Law Board and the Sanitary Board, and it might occur at some given hour of the day that the board of guardians might desire the medical gentleman to perform a function in their service, and the Sanitary Board might wish at the same hour of the day that the same gentleman should perform sanitary functions?—That would be extremely inconvenient, but I imagine that the supposed difficulty might be averted by employing the medical relief officers to perform such sanitary duties and in such manner as might be compatible with the duties which they owe to the board of guardians.

4409. Then you would make the board of guardians the primary authority, so to speak, and the sanitary authority would come in the second rank?—I think certainly so [if the two

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[1] Why not meet the difficulty by combining the two authorities.

authorities were not combined], because the ordinary primary function of those officers is that of medical attendants on the sick poor. I do not propose to interfere at all with their duties to the board of guardians or to the public in that respect. I propose to commit to them some more sanitary functions than they now possess; but whatever duties of that kind might be entrusted to them, would be performed in addition to their medical relief functions, and they would be responsible for the execution of the latter to the sanitary authority.

4410. Still you would relegate their sanitary duties to the second rank rather than place them in the first rank?—I am quite ready to accept that mode of describing their intended position [unless the authorities were combined].

4411. Who do you intend should act as certifying surgeons under the Factory Acts?—I would not interfere with present certifying surgeons at all. If the medical officer of health and registration or his deputy had time enough to devote to the particular functions which are now performed by the certifying surgeons of factories, I think it would be well to transfer their duties to him, on their vacation of office.

4412. Has it not occurred to your mind that the certifying surgeon must be a gentleman who is always at hand and always ready, and that the child whom a parent desires to employ in a factory must be inspected almost immediately, otherwise the child may lose his appointment in the mill?—I understand, but I may have been misinformed, that the children who are candidates for factory work have to apply at certain specified times, say, twice or thrice a week.

4413. But if you enlarge the area, those specified times must become few, and that would be attended with considerable inconvenience to the population who are dependent upon the children's wages for their daily food, and to the manufacturer who is to be supplied with hands in order to conduct his enterprise?—In any such case where a district was extensive, and where the privileges of labour would be interfered with by requiring the candidate for labour to go to a great distance, I think it would be undesirable that the medical officer of health and registration should himself perform those duties. But he might be assisted by official deputies, namely, the poor-law surgeons.

4414. You desire, do you not, that each case of disease should be reported?—Yes, in a tabular form, not each separately. All cases of sickness would be returned, and the cases attended by

each medical officer would be at once tabulated, and in case of any serious epidemic disease, it would be immediately reported to the medical officer of health and registration of the district.

4415. You do not contemplate, I presume, any interference with the freedom of action on the part of private individuals as to their selection of a medical man?—Not in the slightest degree.

4416. Is it your proposal, that where a death occurs in any house a strange medical man should attend and examine the body beyond the private attendant on the family?—That is not my proposition. I propose that there should be such special inspection and visitation only in cases where the return of the cause of death was absent or unsatisfactory. Suppose, for instance, that the medical attendant refused to certify the cause of death, as is not uncommon now, in such a case the public officer would be called in and would be required to examine and report the probable cause of death.

4417. To whom do you propose that this report should be made—to the district inspector?—The medical officer of health and registration, or his deputy, would report the cause of death to the registrar, or refer the inquiry to a coroner's inquest.

4418. What state of the law should you propose as regards permission to bury; should you allow burial to take place before the report had been made?—I have not fully considered that point.

4419. But you must bear in mind that if you have a complicated system great inconveniences might arise, and that those inconveniences would be extremely serious in such a matter as interment?—I think that the present law meets that difficulty tolerably well. I believe that by the present law (I speak under correction), if a clergyman buries anyone without a certificate from the registrar, that certificate must be supplied within a given time afterwards.

4420. You have recommended that the medical officer of the guardians should be the medical officer for your smallest subdivision. I presume that you contemplate having by the side of him a sanitary inspector of an humbler class?—I suppose the inspectors of nuisances would still act. It would be very important that they should continue to act under a better system, unless the police were employed for the same duties.

4421. (*Lord Robert Montagu.*) From this Memorandum on State Medicine which I have before me [*see Appendix*, p. xvii.],

and from your evidence, it appears that your medical inspection is to consist in a minute investigation into the local circumstances which might cause or which might evidence the existence of disease?—Certainly.

4422. Is there not some investigation required prior to that; must we not also know the physical causes of disease generally, irrespective of localities?—Certainly; and on that account it would be necessary that the district officer of health and registration should be a very well-educated man, and one who had had considerable experience in detecting causes of disease.

4423. The district officer would only have it in his power to compare those data and those statistics which occur in his district?—Under such an organization as I propose, all the information collected throughout the country would be at the service of every medical officer of health and registration within it; he would form part of a great system of sanitary inquiry, and he would reap all the advantages of the information to be obtained by that system.

4424. Did I rightly understand you to say that you would have no central inspection?—I certainly never intended to say so.

4425. You would continue the central inspection or investigation which is now conducted by Mr. Simon and the Privy Council Office?—Yes, that was my idea, and I see no reason either to add to the number of such inspectors or to diminish them.

4426. Mr. Simon's chief work consists, does it not, in investigating the general causes of disease?—Yes.

4427. Do you suppose that any district inspector would have been able by the knowledge at his command to have discovered that which Mr. Simon published in his Report to the Privy Council in 1868, namely, the relation of phthisis to the want of drainage in the subsoil?—I do not suppose that every medical officer of health and registration would be fortunate enough to discover every such great principle, but I beg to say that the very observation to which your lordship referred had been made in one at least of the provincial districts before it had been drawn as a general principle by Mr. Simon; and I believe that Mr. Simon's valuable labours and discoveries would be greatly facilitated and promoted by the information which he would derive from those medical officers of health and registration, who, as I have suggested, should be required to forward their reports to him.

4428. Then it appears that you consider it absolutely necessary that in order to ascertain the sanitary condition of localities we should know generally the causes of disease?—Certainly.

4429. And that every measure should be taken to extend the investigations by some officer or officers into the general physical causes of disease?—I do think so.

4430. (*Dr. Acland.*) One of the subjects specially delegated to the Commission is the control of buildings. You have paid great attention, have you not, to the condition of agricultural cottages?—Some little attention.

4431. Have you anything to suggest to the Commission on that subject as to their supervision or construction, or otherwise?—I have simply to suggest that they should be subject to the same kind of supervision as that to which lodging-houses are now subject. I think it is of the utmost importance, in the present state of labourers' cottages throughout the country, infamously crowded as they are now, to the great detriment of health and morals, that they should be subject to a supervision.

4432. Do you think that the guardians as now constituted through their medical officer, and with their power to obtain paid sanitary reports, could easily exercise such supervision?—Perhaps they could, but I beg leave to doubt whether they ever would.

APPENDIX C.

[*From First Report of the Royal Sanitary Commission. Appendix to Minutes of Evidence*, p. xvii. *See Question* 4421.]

MEMORANDUM ON STATE MEDICINE, BY H. W. RUMSEY, M.D., SUBMITTED TO HER MAJESTY'S MINISTERS BY A DEPUTATION FROM THE BRITISH MEDICAL AND SOCIAL SCIENCE ASSOCIATIONS, APRIL 1868.

I. We ask for a thorough, impartial, and comprehensive inquiry into the operation of the several laws, regulations, and customs, under which members of the medical profession are employed, constantly or occasionally, in the towns and rural parishes of England, Scotland, and Ireland, or in some of them, by different departments of Government, by public bodies, by

local authorities, or in voluntary societies; or under which medical practitioners act as witnesses in courts of law and medico-legal inquiries, or otherwise; for any of the following objects and purposes:—

(AGENCY NOW EMPLOYED.)

1. *Mortuary Registration.* | Local Practitioners.

To give information concerning the cause of death, by certificate to the registrars of deaths, and by evidence at coroners' inquests.

2. *Medico-legal Inquiries.* | Special Experts.

To perform *post-mortem* examinations and analyses, in suspicious or obscure cases, for the information of coroners and courts of law.

3. *Medical and Scientific Observations.* | Voluntary enterprise of local practitioners in a few towns.

To record and report, periodically, the number and nature of all cases of sickness (diseases and injuries) attended at the public expense, with their causes and results, and more minutely and frequently during outbreaks of epidemic disease; to observe and record meteorological and other physical phenomena; to note, investigate, and report outbreaks of epizootic and epiphytic diseases, and any exceptional and important local facts of animalcular, parasitic, fungic, or other like invasions.

4. *Medico-sanitary Inquiries.* | Inspectors under Privy Council.

To investigate, and report, on particular occasions, and in selected places, facts and circumstances relating to the prevalence of disease, especially of epidemics.

5. *Interments.* | Inspectors under Home Office.

To inquire into the condition of burial grounds, and to superintend the execution of laws and regulations for the burial of the dead.

6. *Advice and Aid to Authorities.* | Officers acting under Local Boards in certain places.

To afford advice and aid to local authorities in matters relating to the public health, especially as to the avoidance and removal of causes of disease, and the condition and sanitary regulation of common lodging houses and the dwellings of the poor.

7. *Sanitary Measures, Vaccination, &c.* | Inspectors under Privy Council.

To inquire into and report upon the local administration of laws for the prevention of disease and mortality; for instance,

the extent and efficiency of the proceedings under the Nuisances Removal Act; the progress, performance, and results of vaccination, &c.

8. *Workhouses, Medical Relief, and Charities, &c.*	Inspectors under Poor Law Board[1] and Privy Council.

To inquire into and report upon the sanitary condition and management of workhouses; and to inquire into the administration of medical relief to the poor, in districts and workhouse infirmaries, also in medical charities and other public institutions.

9. *Asylums, &c. for the Insane.*	Commissioners in Lunacy, Chancellor's Visitors, County Visiting Physicians, and District Medical Officers.

To inquire into and report upon the condition and management of asylums, hospitals, licensed houses, and lodgings, for the reception and treatment of the insane.

10. *Prisons, &c.*	Inspectors under Home Office.[1]

To inquire into and report upon the sanitary condition and management of prisons, reformatories, and other corrective establishments.

11. *Schools, &c.*	Inspectors under Privy Council.

To inquire into and report upon the sanitary condition and management of elementary schools and other places for the education and industrial training of the young.

12. *Occupations, &c.*	Inspectors under Home Office,[1] Certifying Surgeons, and Officers under local authorities.

To examine and report on the sanitary condition and the protective regulations of mines, factories, potteries, bakehouses, dressmakers' establishments, and all other workplaces, under various enactments for the control and regulation of labour.

13. *Food and Drinks.*	Officers (sometimes Analytical Chemists) under local authorities or county magistrates, in a few places.

To examine into the purity, genuineness, and wholesomeness of articles of food and drink supplied to the community, or to particular classes or public establishments; and to perform chemical analyses and microscopic examinations for the detection of poisons and adulterations.

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[1] Those marked (1) are, with few exceptions, not medical.

14. *Water Supply.*	Officers under local authorities, in some places.

To examine into and report upon the water supply of towns and villages, and the condition of rivers and streams.

15. *Gas, Smoke, and Chemical Works.*	Officers under local authorities. Inspectors under Board of Trade.

To examine into and report upon the supplies of gas, the management of alkali (and other chemical) works, and the prevention of smoke and other noxious vapours, in towns and populous districts.

16. *Animals.*	Officers under local authorities in a few places. Officers under Privy Council in certain cases. Custom-House Officers.

To inspect, with or without the aid of scientific veterinarians, the animals intended for human food; to report and advise upon the manner in which such animals are kept and fed, conveyed by land or sea, and imported, and to assist in carrying into effect any government regulations on these matters; and to examine into and report upon the condition of slaughter-houses, cow-houses, stables, pigsties, &c. &c.

17. *Imported Diseases.*	Quarantine Officer under Privy Council. Officers under local authorities.

To superintend and aid the execution of measures for preventing the importation of foreign pestilence at sea-ports; for regulating the sanitary condition of ships; and for protecting the health of sailors and passengers.

18. *Medico-legal Certificates.*	Any registered medical practitioner. Special experts. Certifying surgeons.

To investigate and certify the condition, physical or mental, of persons accused of crime, or needing legal protection, or demanding compensation for personal injury, or whose competency to fulfil any social or family duty or labour contract becomes the subject of legal inquiry, and to determine the fitness of children and young persons for work.

[*Under this head would be included certificates of insanity, and the duties of certifying surgeons, under various factory and labour enactments.*]

19. *Forensic Evidence.*

To give medical or scientific evidence on any of the preceding matters in courts of law.

(MATTERS TO BE PROVIDED FOR BY SKILLED LOCAL AGENCY.)

II. We suggest that—while many of the provisions and arrangements, described under the preceding head, are of merely partial, occasional, and exceptional application—there are several other objects, at present wholly unaccomplished, as to which legislative action is urgently required, and for the proper fulfilment of which, as also for the purposes before mentioned, the appointment of skilled medical officers in districts would be found necessary; for example:—

1. *Registration.*

To examine and revise all registers of births and deaths in registration districts; to verify the fact of death in certain cases; to investigate and record accurately, in all uncertified or doubtfully certified cases, the cause of death.

2. *Medico-legal Inquiries.*

To bring special knowledge and experience to the conduct, under authorized rules, of *post-mortem* examinations for coroners' inquests or other medico-legal inquiries; and to examine before burial the bodies of infants alleged to be still-born.

3. *Forensic Medicine.*

To act as medical assessors or referees in obscure or disputed cases, sanitary or medico-legal, which require forensic adjudication.

4. *Interments, Mortuaries, &c.*

To advise and assist local authorities in carrying into effect regulations for the removal and burial of the dead, especially in crowded populations and in times of pestilence or great mortality; and to inspect mortuaries or other places for the reception of corpses before burial.

5. *Dwellings.*

To advise and aid local authorities, building societies, and other public companies, in regulating the site, construction, and sanitary arrangements of dwelling houses, especially of those proposed to be erected for the poor, and to certify the satisfactory completion of such undertakings.

6. *Venereal Diseases.*

In all populous districts, to direct and aid the execution of measures concerning the health of women, within the meaning of the Contagious Diseases Prevention Act, 1866, when the main provisions of that Act shall be extended to the civil population of the kingdom.

7. *Pharmacy.*

Aided by skilled pharmacians or scientific chemists, to inspect establishments for the sale and preparation of medicines, and to detect adulterations of drugs.

8. *Medical Police.*

When directed by a proper authority, to inquire into and report upon offences against the Medical Act, especially 'infamous conduct in any professional respect' of medical practitioners, in their respective districts.

9. *Nurses and Female Midwives.*

To inquire into the qualification of midwives and nurses, in the same districts, and to aid in carrying into effect any law which may be enacted for the examination and license of women intending to act in such capacities.

III. We believe that abundant evidence can be adduced to show:—

1. *Defective and incoherent Legislation and Administration.*

That the laws and regulations which relate to the appointment and action of medical men in the statistical, medico-legal, supervisory, and sanitary departments of the public service, are for the most part defective, complicated, and incoherent; that they differ considerably in different places and parts of the kingdom; that they are often inefficient and fallacious in operation, and sometimes even found to be subversive of their professed objects.

2. *No special Qualification for Officers.*

That there is no sufficient guarantee for the general competency or the special qualifications of the medical men appointed; no recognized plan of education for officers of health and medical jurists, nor any examining body for directing the standard of their acquirements and for testing them.

3. *Impediments to free exercise of Opinion and Function.*

That these appointments are made without any proper conditions to secure the free, unbiassed, and unfettered exercise of judgment, delivery of opinion, and discharge of duty.

4. *Ill-defined Districts and conflicting Jurisdictions.*

That the districts and areas of jurisdiction in which sanitary and other public and medical duties are now performed, are not defined or settled on any sound or rational principle; that, except in the metropolis, they are rarely conterminous with other dis-

tricts for local administration or record; and that they are not used for the performance of the same functions in all parts of the kingdom.

5. *Entire neglect of the majority of the Population.*

That the greater portion of the population is now excluded from the benefits which might result even from the present imperfect system of appointments.

6. *Want of authorized co-operation of Officers.*

That there is a total absence of and a great necessity for some authorized co-operation between the several medical persons officially employed in different public duties, within the same district.

7. *Necessity for organization and consolidation of Duties.*

That many sanitary enactments, protective regulations, and medico-legal investigations, are imperfectly carried into effect, owing to the want of a scientific staff of officers, appointed to act in districts of extent sufficient to engage the whole of their time and attention; and that, consequently, an improved organization of districts, and a consolidation of public medical duties therein, are indispensable to the efficiency and economy of local administration.

APPENDIX D.

To His Grace the Lord President of Her Majesty's Most Honourable Privy Council; to Her Majesty's Principal Secretary of State for the Home Department; and to the President of the Poor Law Board:

The Memorial of a Joint Committee of the British Medical and Social Science Associations, appointed to promote a better Administration of the Laws relating to Registration, Medico-Legal Inquiries, and the Improvement of the Public Health,

Humbly showeth,

That it seems to your memorialists not unreasonable to ask that the Imperial Parliament, which for many years has devoted much time and attention to the enactment of laws having

reference to the amount, the causation, and the diminution of mortality in the United Kingdom, should take measures to ascertain how far its benevolent intentions have been appreciated, its laws obeyed, and its suggestions adopted; and how far, on the contrary, local regulations, customs, and prejudices, the parsimony of local authorities, the existence in the same districts of conflicting jurisdictions, and defects or obscurity in the laws themselves, have tended to defeat, in whole or in part, the labours of the legislature.

It is affirmed by those whom large official experience entitles to speak with authority, that the registration of the causes of death, though much more satisfactory than it once was, is still very imperfect; that the registrar's certificate is not accepted as evidence of death by the Bank of England; and that, under the present system, which has doubtless led to the discovery of some murders, but probably allows many to escape detection, scarcely any further improvement is possible; while it makes absolutely no provision for returns of cases of disease not proving fatal, nor of children actually, or reputed to be, still-born.

It is also felt by many, including coroners and others who know its working, that the present mode of conducting medico-legal inquiries tends in numerous instances to defeat the ends of justice; that verdicts are often arrived at by coroners' juries on evidence that is insufficient, erroneous, or misinterpreted; without any *post-mortem* examinations, or after examinations made without the guidance of any fixed rules for the performance of them, and by persons unskilled in such investigations; while it is notorious that the appearance, in courts of justice, of medical witnesses summoned *ex parte* to speak not to matters of fact, but to matters of doubtful opinion, hinders or altogether prevents the discovery of truth, discredits scientific medicine, and is a fruitful source of perplexity and misconception to bench, bar, and jury.

It further appears, from extensive inquiries conducted by private individuals, in the absence of trustworthy official returns, that in many of the towns and districts of this country scarcely a semblance of sanitary organization exists; that the majority of the large towns throughout the kingdom have no medical officers of health, and that, in most of those which have them, their remuneration is utterly inadequate; while, on the other hand, many local boards have been established, and even officers of health appointed, in places which are by far too small and insignificant for separate statistical reports; and that frequently their

position of dependence on the local authorities renders those officers comparatively powerless for good. It appears, moreover, that inspectors of nuisances are often independent of the officer of health, instead of being under his control; that in many towns, where a single inspector, burdened, as is not unfrequently the case, with other laborious duties, is appointed to populations of 30,000, or 40,000, or, as in one case, of 130,000, and likewise in country districts, where such officers exist only in name, there is practically no inspection whatever; and that, owing to the want of public analysts, and competent inspectors of food, the Acts for the prevention of adulteration of food, and of the sale of diseased and unwholesome articles of food, must be, in most cases, a dead letter. It is also proved by the Registrar-General's returns, that the death-rate, instead of being reduced, has in some extensive districts been maintained, while in others it has actually increased, during the last twenty years.

Yet it is believed, by those who have directed their attention to the subject, that the amount actually disbursed under the present disjointed and very inefficient system would, if otherwise distributed—the districts and many of the duties being consolidated—go far to maintain a sufficient staff of specially trained and highly qualified district scientific officers, with inspectorial functions. Without such officers it is vain to expect any material improvement in this important department of the public service.

For all these reasons, and for others set forth in the accompanying 'Memorandum,' (drawn up by Dr. Rumsey, and approved by the Joint Committee,) we ask for a thorough, impartial, and comprehensive inquiry, by a Royal Commission having power to visit, or to send sub-commissioners to visit, the large towns and other districts of the country, to obtain information and evidence, and to report on :—

1. The manner in which the cases and causes of sickness and of death are and should be inquired into and recorded in the United Kingdom.

2. The manner in which coroners' inquests and other medico-legal inquiries are and ought to be conducted, particularly in regard to the methods of taking scientific evidence.

3. The operation and administration of sanitary laws, with special reference to the manner in which scientific and medical advice and aid in the prevention of disease are and should be afforded; and also with special reference to the extent of the areas or districts most convenient for sanitary and medico-legal purposes.

4. The sanitary organization, existing and required, including a complete account of the several authorities and officers. The education, selection, qualification, duties, powers, tenure, and remuneration of the said officers to be specially reported on.

5. The revision and consolidation of the sanitary laws, having special reference to the increase of the efficiency of their administration, both central and local.

Signed, in name and by appointment of the Joint Committee,

J. P. Kay Shuttleworth, Bart.,
Henry W. Acland, M.D. Oxon, F.R.S., } Chairmen.

William Clode,
A. P. Stewart, M.D., } Hon. Secs.

London, *May* 1868.

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